

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

# MFR-5000/8000



**FOR.A**<sup>®</sup>  
INNOVATIONS IN VIDEO  
and AUDIO TECHNOLOGY

## 12G/3G/HD/SD/ASI ROUTING SWITCHER **MFR-5000/8000**

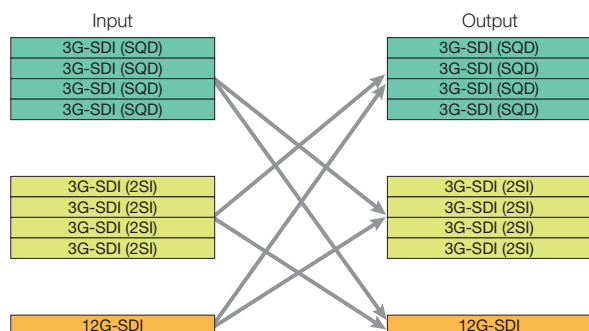


## Expand your 4K/8K routing freedom with 12G-SDI I/O and gearbox support in two models offering the most inputs and outputs in the MFR series

Configure an I/O matrix up to 128 x 128 with the MFR-5000 or 256 x 256 with the MFR-8000.

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.

### 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.

## Ten Highlights Supporting Large-Scale Systems

### 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 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.

- MFR-16AESI: Input card for 16 AES/EBU stereo pairs (32 channels)
- MFR-16AESO: Output card for 16 AES/EBU stereo pairs (32 channels)
- MFR-16AAIEX: Input card for 16 analog audio stereo pairs (32 channels)
- MFR-16AAOEX: Output card for 16 analog audio stereo pairs (32 channels)

### 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

### Series-leading connectivity

Add up to eight 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, 16 x 16 / 64 x 64.

### 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 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.

### Outstanding maintainability

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

### 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.

## Optional

### Video I/O Cards

|   | Input Cards  |             | Output Cards |             |
|---|--------------|-------------|--------------|-------------|
|   | MFR-16SDIA   | MFR-16SDIGB | MFR-16SDO    | MFR-16SDOGB |
| Supported formats                       | 3G/HD/SD/ASI | 12G/3G      | 3G/HD/SD/ASI | 12G/3G      |
| BNC                                     | 16           | 16          | 16           | 16          |
| Ports supporting 12G-SDI                | 0            | 4           | 0            | 4           |
| Gearbox<br>(12G/3G-SDI interconversion) | 0            | 4           | 0            | 4           |



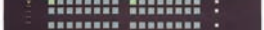






### Audio Input Cards

|                    | MFR-16ADI                        | MFR-16AAI  | MFR-16AAIEX  | MFR-16AESI                                   |
|--------------------|----------------------------------|--|--|--|
| Application        | Embed AES audio to SDI signal.   | Pass through AES audio.                              | Embed analog audio to SDI signal.                    | Convert analog audio into AES audio signals. |
| Interfaces         | BNC x 16                         | 25-pin D-sub (female)<br>Balanced or unbalanced, x 4 | 25-pin D-sub (female)<br>Balanced or unbalanced, x 4 | BNC x 16                                     |
| Channels           | 16 stereo pairs, 32 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   | 75Ω  |
| Sampling frequency | 32 kHz, 44.1 kHz, 48 kHz, 96 kHz | 48 kHz   | 48 kHz   | –  |

### Audio Output Cards

|                    | MFR-16AAOEX  | MFR-16ADAO   |  |   | MFR-16AESO                   |
|--------------------|--|--|--|---|------------------------------|
| 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. | Pass through AES audio.      |
| Interfaces         | 25-pin D-sub (female)<br>Balanced or unbalanced, x 4 | BNC x 8  | BNC x 2<br>(1 ch distributed in 2 ea.) | 25-pin D-sub (female)<br>Balanced or unbalanced, x 4  | BNC x 16                     |
| Channels           | 16 stereo pairs, 32 channels                         | 8 stereo pairs, 16 channels                            | 8 stereo pairs, 16 channels            | 4 stereo pairs, 8 channels                            | 16 stereo pairs, 32 channels |
| Impedance          | Less than 100Ω                                       | 75Ω  | 75Ω                                    | Less than 100Ω  | 75Ω                          |
| Sampling frequency | 48 kHz   | 48 kHz   | 48 kHz                                 | 48 kHz  | –                            |

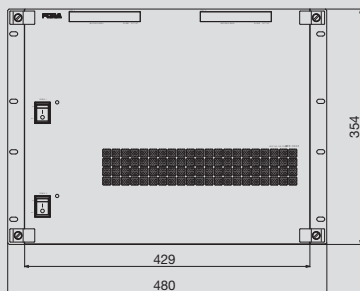
### Remote Control Units

|                                   |  |   |  |
|-----------------------------------|--|---|--|
| Basic models                      | <br><b>MFR-16RUW</b>  | <br><b>MFR-32RUW</b>  | <br><b>MFR-64RUW</b>  |
| Size                              | 1RU  | 1RU   | 2RU  |
| Buttons                           | 16 (green)   | 32 (green)  | 64 (green)   |
| Features                          | 16 customizable buttons  | 32 customizable buttons   | 64 customizable buttons  |
| Standard models                   | <br><b>MFR-16RU</b>   | <br><b>MFR-16RUD</b>  | <br><b>MFR-40RU</b>   |
| Size                              | 1RU  | 1RU   | 1RU  |
| Buttons                           | 16 (green)   | 16 (green)  | 40 (red/green/orange)  |
| Features                          | 16 customizable buttons  | <ul style="list-style-type: none"> <li>16 customizable buttons</li> <li>Equipped with a status/setting menu display</li> </ul>  | <ul style="list-style-type: none"> <li>All buttons are customizable</li> <li>Redundant power supply (AC adapter)</li> </ul>  |
| Full-featured models with display | <br><b>MFR-18RUA</b>  | <br><b>MFR-39RUA</b>  | <br><b>MFR-16RUTA</b>   |
| Size                              | 1RU  | 2RU   | 2RU half tabletop  |
| Buttons                           | 18 (red/green/orange)  | 39 (13 x 3 rows)  | 16 (red/green/orange)  |
| Features                          | <ul style="list-style-type: none"> <li>Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B)</li> <li>All buttons are customizable</li> <li>Redundant power supply (AC adapter)</li> </ul> | <ul style="list-style-type: none"> <li>Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B)</li> <li>6 customizable function buttons (3 colors: R, G, Or) separate from main buttons</li> <li>Equipped with a display showing information on current sources, destinations, and pages</li> <li>Ideal as a main control unit covering the entire crosspoint setup</li> <li>Redundant power supply (AC adapter)</li> </ul> | <ul style="list-style-type: none"> <li>16 customizable buttons</li> <li>Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B)</li> </ul> |

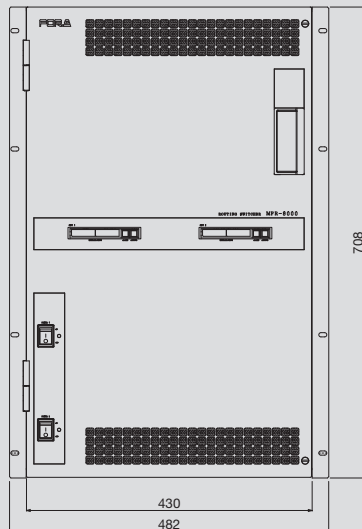
Unit: mm

## External view

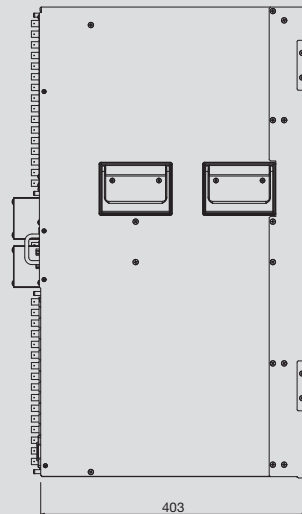
MFR-5000 Front



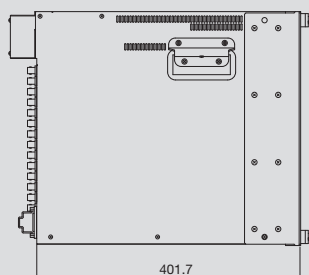
MFR-8000 Front



MFR-8000 Side

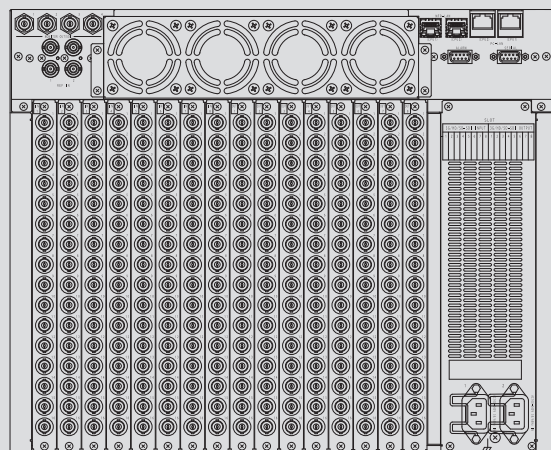


MFR-5000 Side

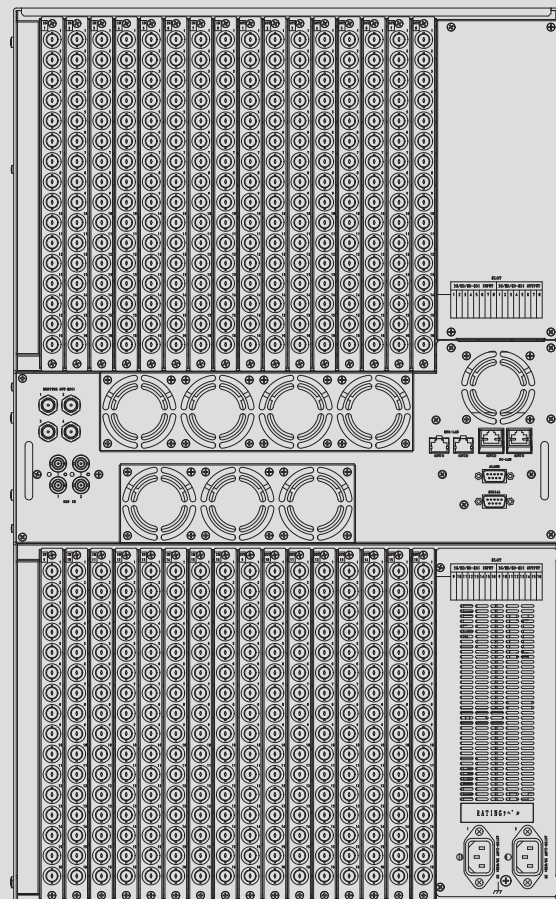


## Rear view

MFR-5000



MFR-8000



## Specifications

|  | MFR-5000   | MFR-8000   |
|--|--|--|
| Video formats                          | 3G: 1080/60p, 1080/59.94p, 1080/50p<br>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, 1080/24p, 1080/24PsF, 720/60p, 720/59.94p, 720/50p<br>SD: 525/60, 625/50                                   |  |
| Matrix size                            | Min. 16 x 16 - Max. 128 x 128 (input slot: x 8, output slot: x 8, expandable in 16-I/O increments), monitor output x 4   | Min. 16 x 16 - Max. 256 x 256 (input slot: x 16, output slot: x 16, expandable in 16-channel increments), monitor output x 4   |
| Video inputs (optional)                | Digital video input compliant with the following (75Ω, BNC)  |  |
| MR-16SDIA                              | SMPTE 424 (3 Gbps), SMPTE 292 (1.5 Gbps), SMPTE 259M (270 Mbps), DVB-ASI   |  |
| MR-16SDIGB                             | SMPTE 2082 (12 Gbps), SMPTE 424 (3 Gbps)   |  |
| Input cable equalization               | 3G/HD-SDI: 100 m (using 5C-FB or equivalent cable: Belden 1694A)<br>SD-SDI: 200 m (using 5C-2V or equivalent cable: Belden 8281)   |  |
| Video outputs (optional)               | Digital video output compliant with the following (75Ω, BNC)   |  |
| MR-16SDO                               | SMPTE 424 (3 Gbps), SMPTE 292 (1.5 Gbps), SMPTE 259M (270 Mbps), DVB-ASI   |  |
| MR-16SDOGB                             | SMPTE 2082 (12 Gbps), SMPTE 424 (3 Gbps)   |  |
| Monitoring output                      | 3G/HD/SD-SDI, DVB-ASI: 75Ω BNC x 4 (Auto reclocking not supported)   |  |
| Audio inputs (optional)                |  |  |
| MFR-16ADI                              | BNC x 16 (16 stereo pairs, 32 channels), 75Ω, sampling frequencies: 32 kHz, 44.1 kHz, 48 kHz, 96 kHz   |  |
| MFR-16AAI                              | 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels), balanced or unbalanced, 600Ω or Hi-Z, sampling frequency: 48 kHz   |  |
| MFR-16AAIEX                            | 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels), balanced or unbalanced, 600Ω or Hi-Z, sampling frequency: 48 kHz   |  |
| MFR-16AESI                             | BNC x 16 (16 stereo pairs, 32 channels), 75Ω   |  |
| Audio outputs (optional)               |  |  |
| MFR-16AAOEX                            | 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels), balanced or unbalanced, less than 100Ω, sampling frequency: 48 kHz   |  |
| MFR-16ADAO                             | BNC x 8 (8 stereo pairs, 16 channels), 75Ω, sampling frequency: 48 kHz<br>BNC x 2 (8 stereo pairs, 16 channels), 75Ω, unbalanced, sampling frequency: 48 kHz<br>25-pin D-sub (female) x 1 (4 stereo pairs, 8 channels), balanced or unbalanced, less than 100Ω, sampling frequency: 48 kHz |  |
| MFR-16AESO                             | BNC x 16 (16 stereo pairs, 32 channels), 75Ω   |  |
| Control signal input/output MFR-16DTIO | 9-pin D-sub (female) x 16  |  |
| Genlock input                          | BB: NTSC 0.429 V (p-p)/PAL: 0.45 V (p-p) or Tri-sync: ±0.3 V (p-p), 75Ω, BNC x 2, with loop-through (to be terminated with 75Ω terminator, if unused)  |  |
| Interfaces                             | MFR-LAN  | 10/100/1000Base-T, RJ-45 x 2 (max.)<br>(Connected to MFR series products. Up to 128 units can be connected.)<br>(Second port only used in MFR-CPU configurations.)   |
|  | PC-LAN   | 10/100Base-TX, RJ-45 x 2 (max.) (Connected to a computer or external device)   |
|  | SERIAL   | RS-422 9-pin D-sub (male) x 1 (can be ordered as RS-232C, using an internal switch)  |
|  | ALARM  | 9-pin D-sub (female) x 1 (Input: reset/Output: alarm (power, fan, crosspoint, CPU))  |
| Temperature/humidity                   | 0°C to 40°C/30% to 85% (no condensation)   |  |
| Power                                  | 100 V to 240 V AC ±10%, 50/60 Hz   |  |
| Consumption                            | Approx. 490 VA (485 W) with 100 V - 120 V AC<br>Approx. 484 VA (469 W) with 220 V - 240 V AC<br>(in a 128 x 128 configuration with a redundant CPU and power supply)   | Approx. 630 VA (623 W) with 100 V - 120 V AC<br>Approx. 638 VA (606 W) with 220 V - 240 V AC<br>(in a 256 x 256 configuration with a redundant CPU and power supply) |
| Dimensions/weight                      | 480 (W) x 354 (H) x 402 (D) mm, EIA 8RU/50 kg (with all options installed)   | 482 (W) x 710 (H) x 403 (D) mm, EIA 16RU/68 kg (with all options installed)  |
| Included accessories                   | Operation manual (CD-ROM), setup guide, AC cord, rack mount bracket, AC cord retaining clip, PWS edge guard  | Operation manual (CD-ROM), AC cord, rack mount bracket, AC cord retaining clip   |
| Consumables                            | Power unit: Replace every 5 years<br>Fans (P-1426, P-1429, P-1430, P-1431):<br>Replace every 4 years   | Power unit: Replace every 5 years<br>Fans (P-1426, P-1429, P-1430, P-1431, P-1499, P-1500, P-1501, P-1502):<br>Replace every 4 years                                 |
| Options*                               | MFR-TALM: Tally manager<br>MFR-GPI: GPI unit<br>MFR-CPU: Redundant CPU card<br>MFR-PS: Redundant power supply unit<br>MFR-RULINK: Remote control relay unit<br>MFR-16DTIO: RS-422 I/O card   |  |

\* See "Options" for details on remote control units, video I/O, and audio I/O cards.



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