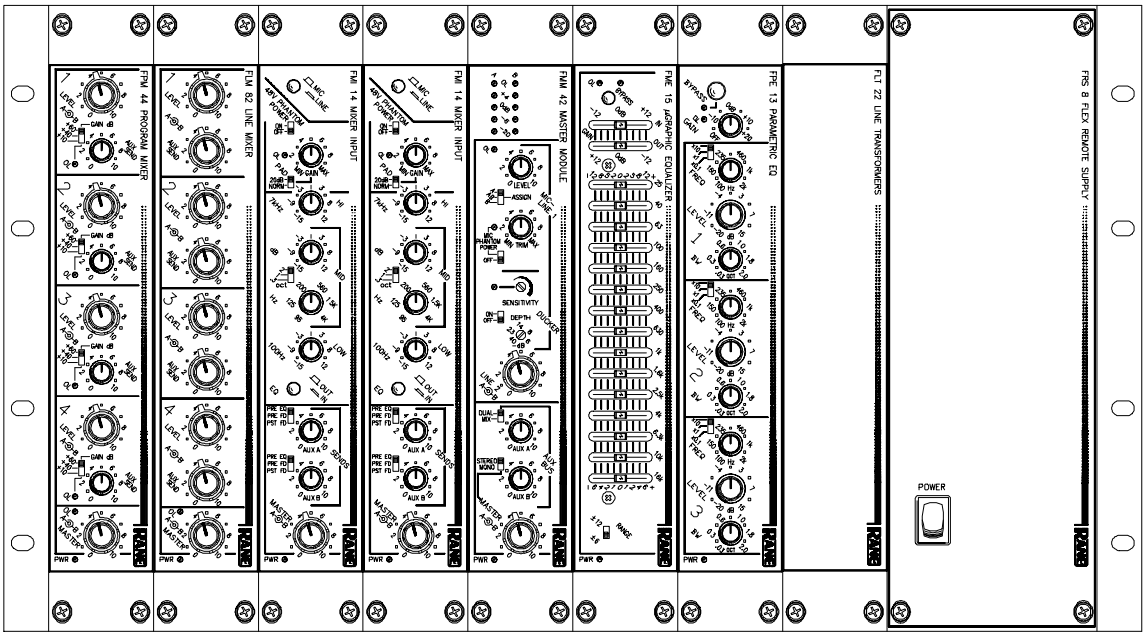


Flex Series Modular Signal Processors

General Description

Rane's Flex Series of modular signal processors represents a milestone in system flexibility, quality and cost-effectiveness. Unlike previous modular approaches, the Flex Series requires no expensive mainframe in order to operate. Each module is self-contained and interfaces directly with other professional audio gear via 3-pin, screw terminals, ¼" and DIN connectors. A multi-pin bus system on Flex mixer modules reduces interconnect wiring to a single short DIN cable (supplied), yet provides the kind of multiple program capability found on large, expensive mixing consoles.

Each Flex module conforms to the industry standard HR (Half Rack) mechanical specifications, allowing vertical or horizontal, recessed or flush mounting into standard EIA equipment racks. Vertical mounting is achieved via a low-cost metal frame which holds 10 modules and occupies 6 rack spaces (10.5"). All active modules are powered externally by either the small RS 1, UL listed, CSA certified, IEC compatible power supply shipped with each unit, or by the vertical-mount FRS 8 Flex unit, or by the horizontal RAP 10 power supply. This low voltage external power supply system—also being standardized by the pro audio industry—significantly improves signal quality, minimizes system grounding problems, and qualifies all Flex modules for Class 2 operation per the National Electrical Code. This means Flex systems carry automatic agency acceptance (UL, CSA, ETL, etc.) without the expensive approval process, allowing the timely development of top quality equipment at more competitive prices.

Flexibility is the key concept for the Flex Series. Each system can be custom tailored to its exact requirements, without the wasted costs of buying more than you need. And designed-in expandability means you can start with minimum outlay and increase system capability as the need and budget allow. This is particularly true when assembling a mixing system with Flex. Any size 4-bus mixer can be assembled with just the right number and type of inputs and equalization. Even a small start-up system offers features such as two separate source-selectable auxiliary buses, insert loops, phantom power and much more. Superlative quality, performance and flexibility distinguish the Flex Series.

Features

- **SELF-CONTAINED MODULES**
- **MAINFRAME NOT REQUIRED**
- **REMOTE UL/CSA/TUV AC POWER**
- **HIGHEST QUALITY PERFORMANCE**
- **BALANCED INPUTS AND OUTPUTS**
- **EXTREMELY LOW NOISE AND DISTORTION**

Features and Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Input Impedance				
.....Line	20k	1%	Ohms	Each Leg to Ground
.....Mic	1k	1%	Ohms	Differential
Max Input Level				
.....Line	+20	1	dBu	
.....Mic	+0	1	dBu	
Input Design	Active Balanced/Unbalanced			True Instrumentation Amplifier
Input Connectors	3-pin, ¼" TRS, Screw Terminal			Check Individual Data sheets
RFI Input Filters	Yes			
Max Output Level	+20	1	dBu	2k Ohms or greater
	+18	1	dBu	600 Ohms or greater
Output Impedance	100	1%	Ohms	Each Leg to Ground
Output Design	Active Balanced/Unbalanced			Cross-Coupled or Differential Line Drivers
Output Connectors	3-pin, ¼" TRS, Screw Terminal			Check Individual Data Sheets
Frequency Response	20-20 kHz	.25	dB	
THD + Noise	.03	.01	%	+4 dBu, 20-20 kHz
IM Distortion (SMPTE)	.03	.01	%	+4 dBu
Signal-to-Noise Ratio	106/90 (re +20 dBu / +4 dBu)	1	dB	Unity Gain, 20 kHz BW
Overload LED Threshold	+16	1	dBu	All critical nodes monitored
Power Supply Input	18 VAC w/center tap	10%	Vrms	
Power Supply Connector	6-pin mod plug			
Remote Power Supply	Model RS 1 Included			See RS 1 Data Sheet
Safety Agency				
.....Classification	Class 2 Equipment			National Electrical Safety Code
.....Design	Safety Extra-Low Voltage			VDE SELV
.....U.L. Listing	U.L. 813 Exempt			Class 2
.....C.S.A. Certification	C22.2 No. 1 Exempt			Class 2
.....CENELEC	IEC 65 Exempt			Harmonization Doc. HD 195.S4
Unit				
.....Construction	All Steel			HR Compatible
.....Size (typical)	8.5"H x 1.75"W x 8"D			(21.6 cm x 4.4 cm x 20.3 cm)
.....Size FSC 22 (only)	8.5"H x 1.75"W x 9"D			(21.6 cm x 4.4 cm x 23 cm)
.....Weight (typical)	4 lb			(1.8 kg)
Shipping				
.....Size	6" x 12.5" x 12.5"			(15.2 cm x 31.8 cm x 31.8 cm)
.....Weight (typical)	6 lb (w/power supply)			(2.7 kg)
.....Weight FBB 44	5 lb			(2.3 kg)
.....Weight FAC 28	7 lb (w/power supply)			(3.2 kg)
.....Weight FLM 82	7 lb (w/power supply)			(3.2 kg)
.....Weight FSC 22	7 lb (w/power supply)			(3.2 kg)
.....Weight FHA 19	1 lb			(.5 kg)
.....Weight FHL 2	1 lb			(.5 kg)
.....Weight FHT 2	7 lb			(3.2 kg)
.....Weight FSB 1	1 lb			(.5 kg)
.....Weight FSC 10	4 lb			(1.8 kg)
.....Weight FVR 10	6 lb			(2.7 kg)
Note: 0 dBu=0.775 Vrms				

Application Information

Flex module design allows both system and stand-alone applications. All modules are complete and functional without other Flex units, and may be used alone or in conjunction with other manufacturer's products.

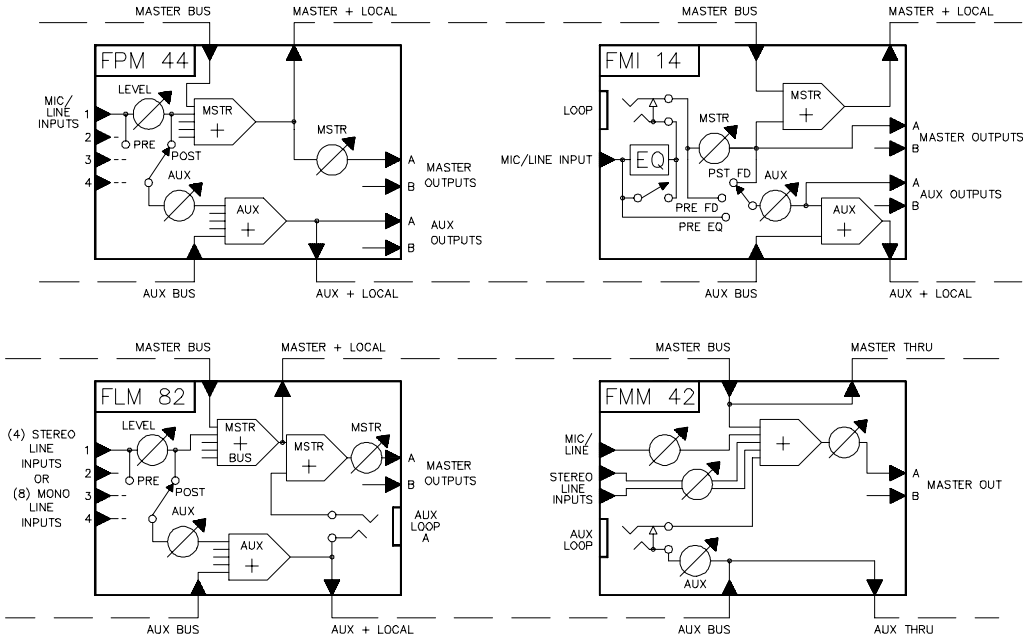
Modules exist with or without bus facilities. Modules without bus options are designed for insert loops and signal path series connection. Examples of these are equalizers, crossovers, and dynamic processors (compressors, limiters, etc.). Modules with buses fall into the mixer category. Examples range from single input full-featured mic input channels, to multi-input stereo line mixers.

The Flex bus system is comprised of four independent buses. These are labeled Master A/B and Aux A/B. Tremendous flexibility exists when using the Flex bus system. Hopefully, the following block diagrams of these Flex mixing modules will help clarify the different bus options. These are offered as an aid in designing systems.

Important differences distinguish each type of module. Beginning at the end, the FMM 42 Mixer Master output module terminates the bus system and supplies metering. The bus-through feature allows paralleling of output modules when required.

To begin or to add to the bus you choose between three modules: The FMI 14 functions identical to a standard mic input channel on a large mixing board. Please note the assignable Aux Send feature.

Mixer Module Bus and Routing Details



The FPM 44 Program Mixer trades off the EQ and looping features of the FMI 14 for multiple mic or line level inputs. Four mic/line inputs exist on the FPM 44 and the Aux Sends are assignable Pre- or Post-fader.

The FLM 82, bus-wise, is similar to the FMI 14 or FPM 44, except restricted to line level inputs, with assignable Aux sends. Note that the FLM 82 can also terminate the bus system, if desired, with provisions for looping the Aux bus inputs into the Master outputs.

Please ask for the **Flex Users Guide** and the individual module data sheets for complete details.

Architectural Specifications

The modular signal processing components shall be 8.5 inches by 1.75 inches by either 8.25 inches, or 9.25 inches deep and shall be housed in an all-steel chassis. Each module shall have a provision for ground-lift. Each module's power supply input shall conform to the proposed AES RAP (Remote AC Power) standard. Each module's physical limits and mounting criteria shall conform to the industry's HR standard (HR1-1988, R789) allowing full compatibility with other such devices.

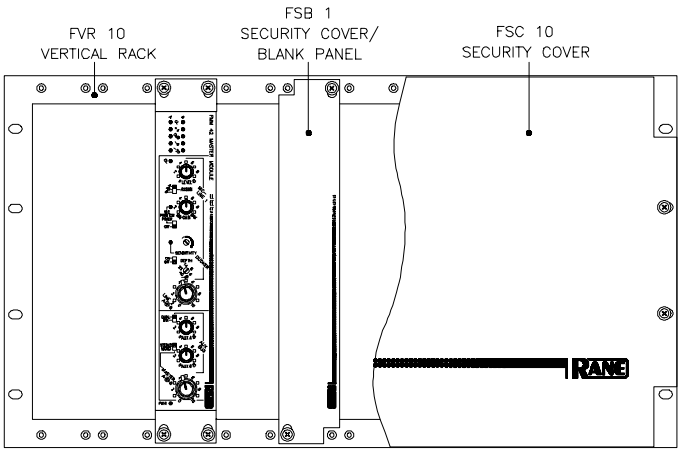
Each module in the system shall furnish a power-on LED. Each module in the system shall contribute less than .03% THD+Noise, and less than .03% Intermodulation Distortion per the SMPTE measurement standard.

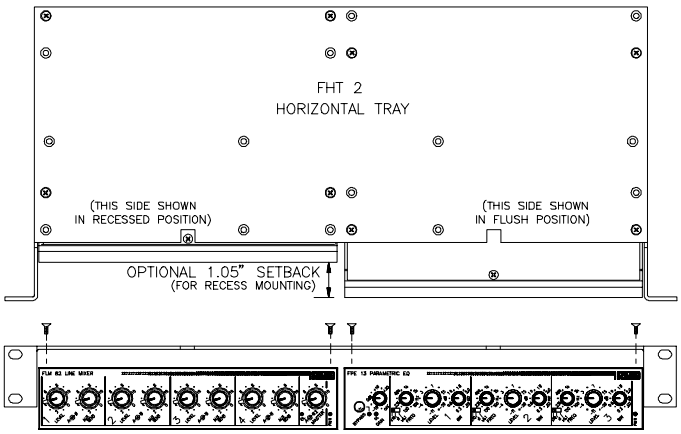
Each module in the system shall have a line level input impedance of 20k Ohms. Each microphone input shall have an input impedance of 1k Ohms. Maximum line input levels shall be +20 dBu. Maximum microphone input levels shall be 0 dBu. Each module shall be provided with an RFI input filter.

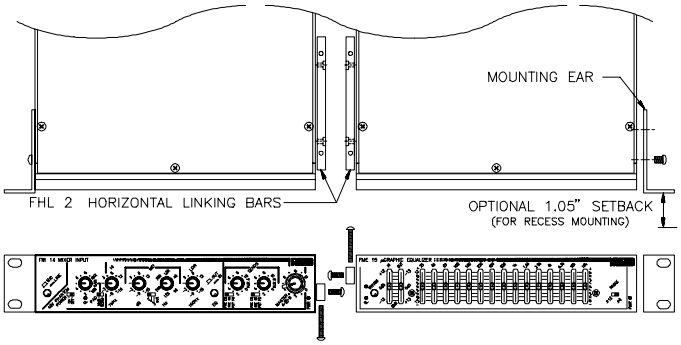
All infrasonic filters in the system shall have a corner frequency of 15 Hz, rolling off at 18 dB/octave or greater, with a Butterworth characteristic and shall be able to be bypassed internally. The connected system frequency response shall not be less than 20 Hz to 20 kHz, ±1 dB.

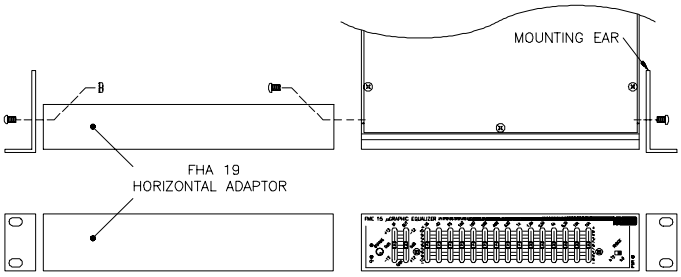
The unity gain signal-to-noise ratio of all modules shall be in excess of 90 dB, re +4 dB, 20 to 20 kHz. The signal threshold of all overload LEDs shall be +16 dBu.

The modular signal processing shall be Rane Corporation Flex Series.









Vertical Mounting Accessories

FVR 10 Vertical Rack

This 12 gauge steel frame mounts up to ten Flex modules in a 19" rack, occupying 10.5" (6U) of rack space. All mounting hardware is included. Rack ears are included with each Flex unit. This is the required rack for mounting the optional FRS 8 Power Supply.

FSB 1 Security/Blank Panel

For use only with the FVR 10. This not only covers unused blank spaces, but can serve as an individual security cover over any recess mounted module.

FSC 10 Security Cover

This completely covers the entire FVR 10 Rack when all modules are recess mounted.

Horizontal Mounting Accessories

FHT 2 Horizontal Tray

This 12 gauge steel tray is recommended for all mobile rack installations. Units mount from the top by four screws apeice, assuring a solid installation. An FHA 19 may fill the empty side when mounting only one Flex unit.

FHL 2 Horizontal Link Kit

This assembly fastens the two inside panels of two Flex units together. Side rack ears come with each Flex unit. This kit is recommended for non-mobile applications, when mounting Flex units next to other 19" rack units.

FHA 19 Horizontal Adaptor

This allows 19" rack mounting of only one Flex unit. It is a shallow metal box with an open back, and uses the rack ears enclosed with each Flex unit.

Other Flex Accessories

Mod Power Cables, 24"

These are spares from the FRS 8 or RAP 10 Power Supplies. Four to a package.

Mod Power Cables, 6'

These connect to the FRS 8 or RAP 10 Power Supplies when greater length is required. Four to a package.

Mod Connector Kit

A standard mod plug crimp tool and (25) RJ-12 plugs are included for custom cable assemblies.

Flex Bus (DIN) Connector Cables

These spares connect the Flex Bus In and Out for mixer-builders. Six feet long, three to a package.

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