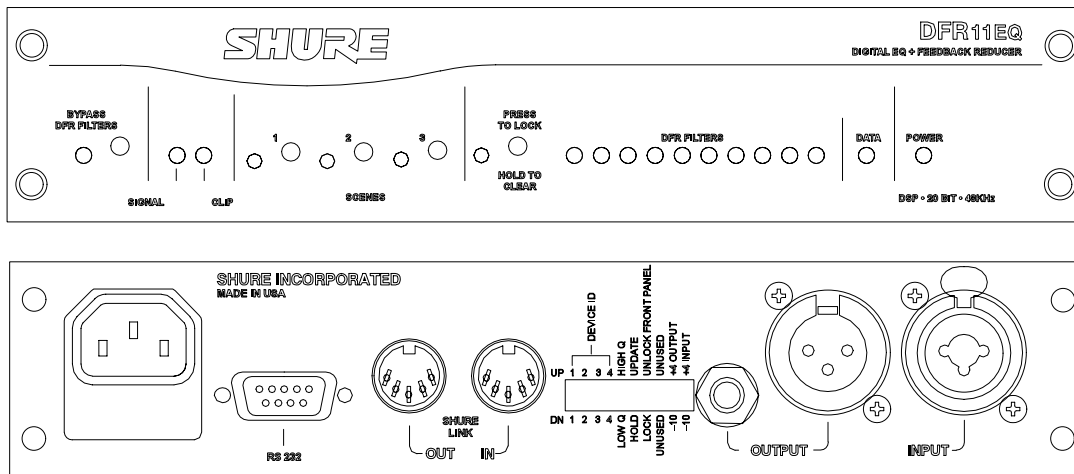


DFR11EQ DIGITAL SIGNAL PROCESSOR

A full-featured signal processor designed for sound reinforcement applications, including theaters, conference rooms, meeting halls and houses of worship. The DFR11EQ offers a straightforward computer control interface that makes sense without a software manual or training course. The system also features tamper-proof front panel lockouts

and the exclusive ShureLink network, which controls up to 16 units from one computer connection.

The DFR11EQ is a true problem-solver with features including 10 automatic, adaptive, feedback filters, equalizer limiter and delay for challenging acoustical situations.



HARDWARE FEATURES

- Crystal* 20-bit A/D and D/A converters (Analog-to-Digital, Digital-to-Analog) allows 104 dB of dynamic range.
- 48 kHz sampling rate provides flat response to 20 kHz.
- Onboard Scenes can be selected via front panel buttons.
- 1/2 rack space chassis allows rack mounting of one or two units in a single rack space with no sagging or bending.
- Shure Link Interface allows multiple Shure Link devices to be controlled with a single computer.
- There are no internal batteries. Settings and DSP program are stored in internal EEPROM.
- Electronically balanced input features combination 1/4-in. and XLR connector and can be used with balanced or unbalanced outputs.
- Independently driven, cross-coupled, balanced 1/4-in. and XLR outputs can be used with balanced or unbalanced inputs, without signal loss.
- Input and output levels are +4 dBu/-10 dBV DIP-switch-selectable.
- 88 MHz Motorola* DSP56009 processor engine features full 24-bit internal processing.
- RS-232 interface allows external computer control and firmware updates.
- Internal linear power supply is switchable between 120 and 230 Vac, eliminating the need for a cumbersome external power supply.
- Solid state bypass eliminates unreliable mechanical relays.

SOFTWARE FEATURES

- Adaptive Notch Filter algorithm (patent pending) automatically detects feedback and deploys up to 10 narrow band notch filters.
- A tamper-proof equalizer can be switched between 30-band graphic or 10-band parametric equalizer.
- The graphic equalizer is a constant-Q, 30-band, 1/3-octave graphic equalizer. It can boost up to 6 dB or cut 12 dB for each band.
- The parametric equalizer offers 10 filters with adjustable frequency, up to 6 dB of boost or 18 dB of cut, and up to a two octave bandwidth.
- Up to 1.3 seconds of Digital Delay.
- Front and back panels both feature lockout control.
- The Response Curve Viewer displays frequency response of the feedback reducer, equalizer, or both.
- 10 scenes can be stored on board. Multiple scenes can be stored to floppy or hard disk.
- The Limiter provides added protection to external speakers and amplifiers.

SPECIFICATIONS

Frequency Response20 to 20k Hz ± 1.0 dB re 1 kHz**Dynamic Range**

104 dB minimum, A-weighted, 20 Hz to 20 kHz

Sampling Rate

48 kHz

Digital-to-Analog, Analog-to-Digital Conversion

20 bit resolution

Voltage Gain

-1 dB \pm 1dB (power off)
 0 dB \pm 2 dB (equal input and output sensitivities)
 12 dB \pm 2 dB (input -10 dBV, output +4 dBu)
 -12 dB \pm 2 dB (input +4 dBu, output -10 dBv)

Impedance

Input: 47 k Ω \pm 20% actual
 Output: 120 Ω \pm 20% actual

Input Clipping Level

+18 dBu minimum (at +4 dBu setting)
 +4 dBV minimum (at -10 dBV setting)

Output Clipping Level

+18 dBu minimum (at +4 dBu setting)
 +4 dBV minimum (at -10 dBV setting)

Total Harmonic Distortion

< 0.05% at 1 kHz, +4 dBu, 20 to 20 kHz

LED Signal Indicators

Clip: 6 dB down from input clipping

Propagation Delay from Input to Output

1.0 ms, all filters set to Flat (0 ms delay setting)

Polarity

Input to output: non-inverting
 XLR: pin 2 positive with respect to pin 3
 1/4-in. TRS: tip positive with respect to ring

Operating Voltage

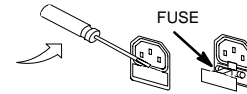
DFR11EQ: 120 Vac, 50/60 Hz, 75 mA max
 DFR11EQJ: 100 Vac, 50/60 Hz, 75 mA max
 DFR11EQE: 230 - 240 Vac, 50/60 Hz, 38 mA max

Temperature Range

Operating: -7° to 49° C (20° to 140° F)

Fuse

DFR11EQ: 120 Vac. Fuse: 100 mA, 250V time delay
 DFR11EQJ: 100 Vac. Fuse: 100 mA, 250V time delay
 DFR11EQE: 230 Vac. Fuse: 50 mA, 250 V time delay
 In order to change a blown fuse, remove the power cord
 and pry open the drawer with a flathead screwdriver.
 Ratio: ∞ to 1

**Dimensions**

219 mm x 137 mm x 44.5 mm
 8 5/8 in x 5 3/8 in x 1 3/4 in

Weight

930 g (2.05 lbs)

FEEDBACK FILTERS

Ten (10) 1/10-octave adaptive notch filters from 60 Hz to 20 kHz

Deployed to 1 Hz resolution of feedback frequency

Deployed in depths of 3 dB, 6 dB, 9 dB, 12 dB, and 18 dB (12.5 Low Q in graphic EQ mode) attenuation

Filter shape variable between HI Q and LOW Q (see *High Q vs. Low Q Filters*).**GRAPHIC EQUALIZER****Frequency Bands**

30 bands on ISO, 1/3-octave centers

Filter Type

1/3-octave, constant Q

Maximum Boost

6 dB per band

Maximum Cut

12dB per band, high- and low-pass filters, 12dB/octave nominal

PARAMETRIC EQUALIZER**Frequency Bands**

10 bands, variable frequency, variable Q

Boost/Cut Range

+6 dB to -18 dB per band

Q Range

1/40-octave to 2 octave

Shelf/Rolloff Filters

Shelf, +6 to -18 dB per filter
 Rolloff, 6dB, 12dB, 18dB, or 24dB per octave nominal

DELAY

Up to 1.3 seconds

LIMITER

Threshold: -60 dBFs to -0.5 dBFs, 0.5 dB resolution

Attack: 1 ms to 200 ms

Decay: 50 ms to 1000 ms

DFR11EQ AUDIO INPUT

| | | |
|---|--|--|
| Connector: (XLR and 1/4-inch combined) | XLR (female) | 1/4-inch phone plug (female) |
| Configuration: | active balanced | active balanced |
| Actual Impedance: | 47 kΩ | 47 kΩ |
| Nominal Input Level: | +4 dBu (+4 input level) -10 dBV (-10 input level) | +4 dBu (+4 input level) -10 dBV (-10 input level) |
| Maximum Input Level: | +18 dBu (+4 input level) +6 dBV (-10 input level) | +18 dBu (+4 input level) +6 dBV (-10 input level) |
| Pin Assignments: | Pin 1 = ground Pin 2 = hot Pin 3 = cold | Tip = hot ring = cold sleeve = ground |
| Voltage / Current/ Phantom Power Protection? | yes | yes |

DFR11EQ AUDIO OUTPUT

| | | |
|---|--|--|
| Connector: (XLR and 1/4-inch separate) | XLR (male) | 1/4-inch phone plug (female) |
| Configuration: | active balanced cross coupled | active balanced cross coupled |
| Actual Impedance: | 120 Ω | 120 Ω |
| Nominal Output Level: | +4 dBu (+4 output level) -10 dBV (-10 output level) | +4 dBu (+4 output level) -10 dBV (-10 output level) |
| Maximum Output Level: | +18 dBu (+4 output level) +6 dBV (-10 output level) | +18 dBu (+4 output level) +6 dBV (-10 output level) |
| Pin Assignments: | Pin 1 = ground Pin 2 = hot Pin 3 = cold | Tip = hot ring = cold sleeve = ground |
| Voltage / Current/ Phantom Power Protection? | yes | yes |

CERTIFICATIONS

DFR11EQ (Version 5)
UL Listed and cUL Listed to UL 6500 and CSA E65. Approved under the verification provision of FCC part 15 as a Class B Digital Device.
DFR11EQE (Version 5)

NOTE:

*EMC conformance testing is based on the use of supplied and recommended cable types. The use of other cable types may degrade EMC performance.

*Under extremely abnormal conditions of electrical fast transients on the power line, communication may be interrupted between the DFR11EQ and the controlling PC. The unit will not be damaged; normal operation will resume after the CONNECT button or command is used to restore the connection

Eligible to bear CE marking. Conforms to European Union Low Voltage Directive 73/23/EEC; VDE GS-Certified to EN 60065. Conforms European Union EMC Directive 89/336/EEC; Emissions per EN 50081-1 (1992) and Immunity per EN 50082-1 (1992).

FURNISHED ACCESSORIES

| | |
|--|----------|
| Power Cable (DFR11EQ5/DFR11EQJ)* | 95A8389 |
| Power Cable (DFR11EQ5E)* | 95A8247 |
| Power Cable Clamp* | 95A8712 |
| 5-pin DIN Shure Link Cable | 95A8676 |
| Single Mount Rack Bracket | 53A8450 |
| Dual Mount Rack Bracket | 53B8442 |
| Straddle Bars | 53B8443 |
| DFR11EQ Version 5 Software/User's Guide CD-ROM | 95A8830A |

*NOTE: The power cord and power cable clamp is supplied assembled. If a replacement power cord is needed, a power cord clamp is also required. If not assembled, the power cord clamp should be clamped as close to the female end of the power cord as possible.