



# OPERATING MANUAL

## DIGITAL DISTRIBUTOR



MODEL **SM-DX-4800**

# IMPORTANT SAFETY INFORMATION

## Safety Instructions

**1. READ THESE INSTRUCTIONS.** All the safety and operating instructions should be read before the product is operated.

**2. KEEP THESE INSTRUCTIONS.** The safety and operating instructions should be retained for future reference.

**3. HEED ALL WARNINGS.** All warnings on the product and in the operating instructions should be adhered to.

**4. FOLLOW ALL INSTRUCTIONS.** All operating and use of instructions should be followed.

**5. DO NOT USE THIS APPARATUS NEAR WATER.** Do not use the product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

**6. CLEAN ONLY WITH DRY CLOTH.** Unplug the unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a dry cloth for cleaning.

**7. DO NOT BLOCK ANY VENTILATION OPENINGS.** Slots and openings in the cabinet back or bottom are provided for ventilation, to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should never be placed near or over a radiator or heat source. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

**8. DO NOT INSTALL NEAR ANY HEAT SOURCES.** This product should be situated away from heat sources such as radiators, stoves, or other products (including amplifiers) that produce heat.

**9. DO NOT DEFEAT THE SAFETY PURPOSE OF THE POLARIZED OR GROUNDING-TYPE PLUG.** A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

**10. PROTECT THE POWER CORD FROM BEING WALKED ON OR PINCHED PARTICULARLY AT**

**PLUGS, CONVENIENCE RECEPTACLES, AND THE POINT WHERE THEY EXIT FROM THE APPARATUS.**

**11. ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.**

**12. USE ONLY WITH CART, STAND, TRIPOD, BRACKET, OR TABLE SPECIFIED BY THE MANUFACTURER, OR SOLD WITH THE APPARATUS. WHEN A CART IS USED, USE CAUTION WHEN MOVING THE CART/APPARATUS TO AVOID INJURY FROM TIP-OVER.** Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury to someone, and serious damage to the appliance. A unit and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

**13. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.** For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

**14. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANYWAY, SUCH AS WHEN THE POWER SUPPLY CORD OR PLUG IS DAMAGED, LIQUID HAS BEEN SPILLED OR OBJECTS HAVE FALLEN INTO THE APPARATUS, THE APPARATUS HAS BEEN EXPOSED TO RAIN OR MOISTURE, DOES NOT OPERATE NORMALLY, OR HAS BEEN DROPPED.**

**15. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.**

**16. APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.**

## INTRODUCTION

The SM-DX-4800 series is a digital distributions system designed for fixed sound installations. The absolute latest in available technology is utilized with 32-bit (40-bit floating point) processors and high performance 24-bit Analog Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices.

Features a complete set of parameters include I/O levels, delay, polarity, 6 bands of parametric EQ per channel, multiple crossover selections and full function limiters. Precise frequency control is achieved with its 1 Hz resolution. Inputs and outputs can be routed in multiple configurations to meet any requirement.

The SM-DX-4800 can be controlled or configured in real time on the front panel or with the intuitive PC GUI accessed via the USB or RS485. Multiple setup storage and system security complete this professional package.

## FEATURES

- › 32-bit (40-bit floating point) DSP (Highly accurate digital processing)
- › High Performance 24-bit A/D and D/A Converters
- › Accurate 1 Hz Frequency Resolution
- › 6-Band Parametric Equalizers for each Input and Output
- › Full-Function Limiters on Output Channels
- › "One Touch" easy access setup button
- › Backlit 4-Line x 32 Character LCD Display
- › Full 5-segment LEDs on every Input and Output
- › Storage up to 30 Program Setups
- › USB and RS-485 interfaces for PC Control and Configuration
- › Pink noise and single frequency generator
- › Original Neutrik XLR connectors
- › Security Lock

# SPECIFICATIONS

**Note:** Specifications subject to change without notice

Model	SM-DX-4800
Inputs and Outputs	Input Impedance: >10k Ohms Output Impedance: 50 Ohms Maximum Level: +20dBu Type: Electronically balanced
Audio Performance	Frequency Response: +/- 0.1dB (20 to 20 kHz) Dynamic Range: 115dB type (unweighted) CMMR: > 60dB (50 to 10 kHz) Crosstalk: < -100dB Distortion: 0.002% (1 kHz @+4dBu)
Digital Audio Performance	Processor: 32-bit (40-bit floating point) Sampling Rate: 48 kHz Analog Converters: High Performance 24-bit Propagation Delay: 1.5ms
Front Panel Controls	Display: 4 x 32 Character Backlit LCD Level Meters: 5 segment LED Buttons: Mute/Edit Controls Menu Controls Dial Encoder: Embedded Thumb Wheel
Connectors	Audio: 3-pin XLR RS-485 X 2 USB: Type B
General	Power: 90-120 or 200-240 VAC (50-60Hz) Dimensions: 19"x1.75"x9" (483x44x229 mm) Weight: 7lbs / 3.2kg
Audio Control Parameters	Gain: -40 to +15dB in 0.1dB steps Polarity: +/- Delay: Up to 1000ms per I/O Parametric Equalizers (6 per I/O) Type: Parametric, Hi-shelf, Lo-shelf Gain: -40 to +12dB in 0.1dB steps Bandwidth: 0.05 to 3 octaves (Q=0.404 to 28.852) Crossover Filters (2 per Input / Output) Filter Types: Butterworth, Bessel, Linkwitz Riley Slopes: 12 to 48dB/Oct
Limiters	Threshold: -20 to +20dBu Attack: 0.3 to 100ms Release: 2 to 32X the attack time
System Parameters	No. of Programs: 30 (10 factory programs and 20 user defined) Program Names: 12 character length Delay Units: ms, ft, m Frequency Modes: 36 steps/Oct, 1Hz resolution Security Lock: Lock/Unlock Copy channels: All parameters (with PC software) Channel Names: 6 character length
Compliance	     (E144572-A29-UL-1)
Safety information	Mount unit in locations that provide unobstructed air movement to minimise the risk of overheating.

# USER INTERFACE



## FRONT PANEL

- 1. USB** – a standard Type B USB connector. Proper device driver must be installed prior to usage. The red LED will come on for indication when USB cable connected.
- 2. Mute keys** – Mute/Unmute input and output channels. When an input channel is muted, a red LED will come on for indication. When Menu Control key is pressed, it selects the corresponding channel for the LCD menu display and is acknowledged by a green LED above the buttons. The last modified menu will be displayed on the LCD. While the Menu Control key is held down, multiple channels can be linked or unlinked by pushing the desired channels. This eases programming for the same parameters across multiple channels. Multiple Inputs can be linked together and multiple outputs can be linked together. Inputs and Outputs are linked separately.
- 3. Peak Level LED** – Indicates the current peak level of the Signal: Signal, -12dB, -6dB, -3dB, Over/Limit. The Input Over LED references to the device's maximum headroom. The Output Limit LED references to the threshold of the limiter.
- 4. Menu keys** – There are 8 menu keys for Signal-Gain/Phase/Delay, EQ, X'over (Crossover), Limiter, Channel (Input Mix), Name (Channel name) for each input/output channel and System and Exit control for the main system.
- 5. Rotary Thumb Wheel** – Changes parameter data values and confirm. The wheel has travel velocity sensing which eases large incremental data modifications. For modifying delay and frequency (1 Hz resolution), pressing the Speed key simultaneously will increment/decrement the data value by 100X. To confirm the setting push the wheel one time.
- 6. LCD** – 4 line x 32 characters displays all the necessary information to control the unit.
- 7. Cursor control** – 4 key for Cursor control.



## REAR PANEL

- 1. Main Power** – Connects via external power supply. A compatible power cord is supplied with the unit. The voltage input is 100-240VAC, 50-60Hz, 0.8A.
- 2. RS485** – Allows remote control of the device up to 1000M.
- 3. XLR input and outputs** – Separate 3-pin XLR connectors are provided for each audio input and output. The device's output stage employs the balanced impedance topology. All I/O connectors have pin 1 as ground (shield), pin 2 as + and pin 3 as -.
- 4. Power supply** – external power supply with standard IEC socket and compatible plug for your country.

## DIMENSIONAL DIAGRAM



## POWERING UP THE DEVICE

- › After powering up the unit, the initialization screen is displayed on the LCD.
- › The initialization process takes about 8 seconds and during that period the unit boots and displays the device model and firmware version.
- › After the initialization process is finished the DX displays its main screen.
- › The screen shows the current program number and program name assigned to the unit. If the 2 fields are empty, it means that no program is assigned, the last data before the previous power down is recalled instead.
- › Now the SM-DX-4800 is ready to operate.

## OPERATING THE DEVICE

**Tips: Channel Linking** – While holding down the Mute for 2 Seconds, more than 1 channel from the same group (Input or Output group) can be selected to link the channels together. The green LEDs above the Mute buttons are lit for the linked channels. Any modification of the data for the selected channel will be applied to the linked channels as well. To cancel the linking, simply deselect the desired channel if the Mute key is still pressed.

# INPUT MENUS

Each of the SM-DX-4800's input channels has a separate Mute key. Hold down the Mute key for 2 seconds then the Channel menu can be used and the green LEDs above the Mute button are lit.

## One Touch easy access setup button

SM-DX-4800 has 8 one touch setup buttons allowing the user direct control for Signal, EQ, X'over, Limiter, Channel, Name for each input/output, and System and Exit button.

## Signal-Gain/Phase/Delay - Signal parameters

- › **LEVEL** – Gain, -40.00dB to +12.00dB in 0.1dB steps.
- › **POL** – Polarity, can be normal (+) or inverted (-).
- › **DELAY** – Delay in 21us steps. Can be displayed in ms, ft or m. The time unit of the delay can be changed in the System menu. The maximum delay permitted is 1000ms.

```
OUT_1:XXXXXX MENU:Signal
LEVEL:0.00dB
POL :+
DELAY :0.105ms
```

## EQ – EQ parameters

- › **EQ#** – Selects one of the 6 available Equalizers.
- › **LEVEL** – EQ level gain. Ranges from -30.00dB to +15.00dB in 0.1dB steps.
- › **FREQ** – EQ center frequency. Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps
- › **BW** – EQ Bandwidth. Ranges from 0.05 to 3.00 octaves in steps of 0.01 octave steps for PEQ. The Q value is automatically shown beneath the octave value. For Lo-Shf or Hi-Shf, it is either 6 or 12dB/Oct.
- › **TYPE** – Type of EQ. The types can be parametric (PEQ), Lo-shelf (Lo-shf) and Hi-shelf (Hi-shf).

```
OUT_1:xxxxxx MENU: EQ
EQ#:EQ1 BW:0.50OCT
LEVEL:0.00dB Q=28.85
FREQ : 1000HZ TYPE:PEQ
```

## X Over – Crossover Parameters

- › **FTRH** – Filter Type of low frequency crossover point (high pass). Types can be Butterworth, Linkritz Riley or Bessel.

- › **FRQH** – Filter cut-off Frequency of low frequency crossover point (high pass). Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave Asteps. The frequency steps can be selected in the SLPH (below).
- › **FTRL** – Filter Type of high frequency crossover point (low pass).
- › **FRQL** – Filter cut-off Frequency of high frequency crossover point (low pass).
- › **SLPL** – Filter Slope of low frequency crossover point (high pass). Ranges from 12 to 48dB/octave. If the selected Filter Type is Linkritz Riley, the available slopes are 12 / 18 / 24 / 48 dB/octave.

```
OUT_1:XXXXXX MENU:X-Over
FTRH: Butwrth FTRL: Butwrth
FRQH: 1000Hz FRQL:1000Hz
SLPH: 24dB SLPL:24dB
```

## Limiter – Output Limiter

- › **THRESH** – Limit Threshold. Ranges from -20 to +20dBu in 0.5dB steps.
- › **ATTACK** – Attack time. Ranges from 0.3 to 100ms in 0.1ms steps, then ranges from 1 to 100ms in 1ms steps.
- › **RELEASE** – Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

```
OUT_1:XXXXXX MENU:Limiter
THRESH:+20.0dB
ATTACK:10ms
RELEASE:2X (20ms)
```

## Channel – Input Mixer

- › **1,2,3,4** – Input channel source for the current output channel. Can be used to mix the input source or to disable it (Off). If more than one input sources are enabled, they will be added together as the source for the current output channel.

```
OUT 1 : MENU:Source
InA:ON
InB:ON
InC:OFF
InD:OFF
```

## Name – Channel Name

- › **Name** – Channel name. It is 6 characters in length.

```
OUT 1:XXXXXX MENU:Name
NAME:XXXXXX
```

# SYSTEM MENUS

The **System Menus** allow the user to control and change parameters that are related to the system behavior and general operation. It can be accessed by pressing the **System one touch key**.

```
SYSTEM MENU
Load a Xover
Store a Xover
Erase a Xover
System Set
Signal Generate
```

## Load a Xover – Program Recall

The SM-DX-4800 has a built in non-volatile memory that can store up to 30 different program setups. A program can be recalled using this menu.

```
Load a Xover
*User Mode
Factory Mode
↓
Load a Xover: User Mode
*1
2
3...
```

› **PROG** - Program Number to be recalled.

## Store a Xover – Program store

The SM-DX-4800 has a built in non-volatile memory that can store up to 30 different program setups. A program can be stored using this menu. The old program with the same program number will be replaced. Once the program is stored in the flash memory, it can be recalled at a later time, even after power down.

```
Store a Xover
*1
2
3...
```

› **PROG** - Program Number for the current data to be stored.

```
Erase a Xover
*1
2
3...
```

## System set

```
SYSTEM MENU
*Password
BackLight Set
Delay Unit
Device ID
System info
```

## Password

The password of the DX is 6 characters in length.

```
SYSTEM SETUP MENU: Password
*-----*
*0 *
*-----*
```

## BackLight Set

```
SYSTEM SETUP MENU: Time
Light on / 20 s
```

The LCD display can set always on or switch off after 20 seconds.

## Delay ID

```
SYSTEM SETUP MENU: Delay
DELAY UNIT: ms /cm / ft
```

Set the Delay unit in ms or cm or ft.

## Device ID

```
SYSTEM SETUP MENU: Device
DEVICE ID: 1
```

Set the Device ID from 1 to 250

```
System Info
Version: V1.0.1
Copyright :
Created by:
Created Date:
```



# SYSTEM MENUS

## Signal Generate

```
*Normal
Pink Noise
Tones ( XXXX Hz)
```

**Normal** – Normal mode

**Pink Noise** – Pink Noise Generate mode

**Tones** – Tones mode, can select any frequency from 20Hz to 20kHz.

› **NAME** – Program Name, allows a maximum length of 15 characters.

```
SYSTEM Recall
P:1 XXXXXXXXXXXXX
SYSTEM Store
P:1
SYSTEM Store
NAM:XXXXXXXXXXXXX
```

## Security - Security Lock

The SM-DX-4800 enables the user to secure the unit and prevent undesired changes in the setup. In order to lock/unlock the unit the user must enter the correct password.

› **PASSWORD** – Under the System Menu

The password of the DX is 6 characters in length.

The user can change it via the PC application software. The factory default of a new unit does not require a password.

```
*Password
↓
SYSTEM SETUP MENU: Password
*-----*
*0 *
*-----*
```

## QUICK REFERENCE

### Parameters Menu

<<Menu>>

#### Field

<<Cursor>> Min Max Steps Units

Level Signal LEVEL -40 +15 0.1 dB

Polarity Signal POL + / -

Delay Signal DELAY 0-1000ms 21us steps

EQ Number EQ EQ# 1- 6

EQ Level EQ LEVEL -30 +15 0.1 dB

EQ Frequency EQ FREQ 20 20,000 1 Hz

EQ Bandwidth EQ BW 0.05 to 3 0.01 Octave

Crossover Low XOver FTRH / Butterworth / Linkwitz-  
Riley / Bessel

Crossover Low XOver FRQH 20 20,000 1 Hz

Crossover Low XOver SLPH 12/18/24/48 octave

Crossover High XOver FTRL Off / Butterworth /  
Linkwitz-Riley / Bessel

Crossover High XOver FRQL 20 20,000 1 Hz

Crossover High XOver SLPL 12/18/24/48 octave

Out Limiter Thresh Limit THRESH -20 +20 0.1 dBu

Out Attack Time Limit ATTACK 0.3-100ms 1 ms

Out Release Time Limit RELEASE 2 / 4 / 8 / 16 / 32X

Attack time

Source Source 1, 2, 3, 4 Off / On

Channel Name Ch-Name NAME 6 characters

## PC CONTROL SOFTWARE

The SM-DX-4800 series is shipped with special PC Control Software which gives the user an option to control the unit from a remote PC via the USB or RS485 serial communication link. The software makes it much easier to control and monitor the device allowing the user to get the whole picture on one screen. Programs can be recalled and stored from/to the PC's hard drive.

The LCD will display below when PC software is connected.

PC Connection.....

### **Note:**

Software compatible with Windows 7 (32 bit) and earlier.

# EXAMPLE LAYOUT

RANDOM DIGITAL NOISE GENERATOR [SM-GR-3100](#)



DIGITAL EQUALIZER [SM-EQ-2000](#)



DIGITAL DISTRIBUTOR [SM-DX-4800](#)



DIGITAL AMPLIFIER [SM-DA-8000](#)



CEILING TRANSDUCER [SM-T-1200](#)



- NOTES**
- › Each [SM-T-1200](#) pictured represents 100 transducers.
  - › The [SM-DA-8000](#) is capable of servicing up to 800 transducers.
  - › Diagram not to scale.

## TROUBLESHOOTING

If the unit is running slowly or “freezes up”, reset the unit by turning it off using the power switch.


Leave the unit to reset for 15 minutes before turning the power switch on again.

**For any further problems, contact us via the detail below.**

## CONTACT


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## NOTES



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