SUBMIX™

500 Series 4x1 Line Mixer

User Guide

www.radialeng.com

SUBMIX™
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Congratulations on your purchase of the Radial Submix, an innovative 500 series module that lets you mix 4 line level sources such as keyboards, drum machines, effects returns, computers and just about any other audio source together inside any 500 series rack.

Should you find yourself asking a question that is not addressed, we invite you to view the Submix FAQ page on our web site. This is where we post the latest hints and of course questions from users. If you still do not find what you are looking for, feel free to send an email to info@radialeng.com and we will do our very best to respond to you in short order.

Now get ready to start connecting more cables and wires... cause this is what audio engineers love to do most!

⚠️ **WARNING NOTICE TO USER!**

Although preventative safety measures have been designed into Radial 500 series products **we strictly advise against hot swapping modules** or plugging and unplugging them when the Workhorse or other 500 series rack is powered on. Hot swapping can cause connection sparks at the card-edge connector that could send damaging transients to other equipment. This also greatly reduces the life span of the contacts. Damage due to hot swapping is not covered under warranty. There are no user serviceable parts inside.

OVERVIEW

The Submix is a four input, one output mixer (4x1) in a single card slot module designed to fit the 500 series format. It follows convention with the 15-pin edge connector so that it works in all 500 series power racks. Each of the front panel ¼" inputs are designed to accommodate all types of unbalanced line level signals. Examples include instruments such as keyboards, samplers and electronic drums, plus line-level sources such as tape machines, effects returns, CD players, iPods, and computer audio outputs. These are then quickly mixed using the four front panel control knobs.
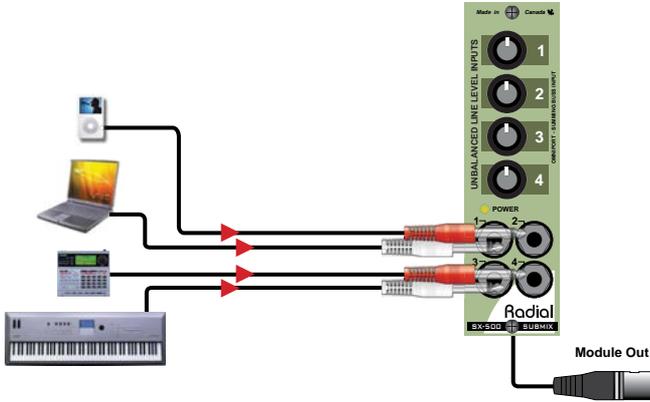

Typical 4x1 line mixer setup.

For those equipped with a Radial Workhorse 500 series power rack, the Omniport functions as an expansion buss to enable two or more Submix modules to be combined creating a larger mixer.
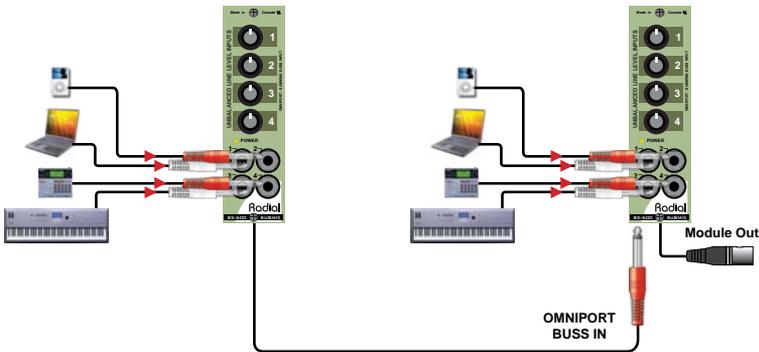
Using the Omniport buss input to create an 8x1 line mixer (Radial Workhorse power rack only).

FEATURE SET

1. LEVEL 1 thru 4: Accustate input control, simultaneously adjusts the sensitivity and gain for maximum signal to noise. Use to adjust input levels for each of the four channels.

2. CHANNEL ID: Easy to read input channel identification improves workflow efficiency in the studio.

3. POWER: LED indicator illuminates when the module is energized by the power rack.

4. INPUTS: Four separate ¼" inputs to connect keyboards, drum machines, effects returns and other unbalanced line level sources.

5. XLR OUT: The Submix routes the 4 channel mix to the XLR output on your 500 series power rack.

6. OMNIPORT: Designated as a virtual-earth mix-buss input, enables multiple Submix modules to be used together when used with a Workhorse to create 8x1, 12x1 or larger mixers.
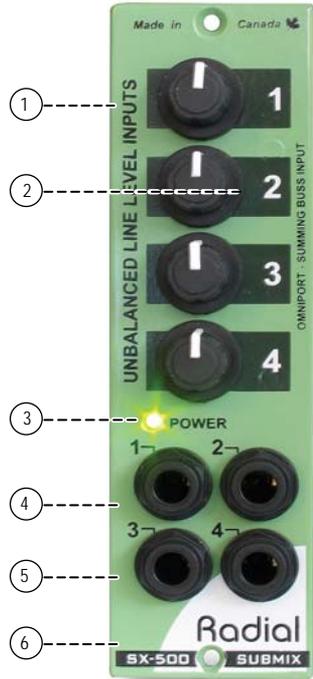
GETTING STARTED

Although the Submix is extremely easy to use, we suggest you follow these simple instructions before using it. As with all audio equipment, always ensure all levels are turned down and equipment is turned off before making any connections or inserting the Submix into a 500 series power rack. This common practice ensures turn-on transients will not damage more sensitive components such as tweeters. Screw the module in to ensure it does not accidentally get dislodged.

Making connections

Four high-impedance ¼" inputs on the front panel correspond to the four level controls. Line-level sources connect to the inputs using standard instrument cables. Mixer channel-1 can also accept a balanced line signal via the rear panel XLR input jack. However, the front jack has priority over the rear and inserting a plug into the front channel-1 ¼" input will defeat the rear XLR input. To use the rear XLR input, ensure the front input is not connected.

The Submix uses the rear panel XLR output for the master mix output. This balanced line-level signal connects to your recorder or mixing console or to more 500 series signal processors like the Radial Komit compressor. If you are using the Submix in a Workhorse power rack, the FEED function can automatically route the output to the adjacent module.
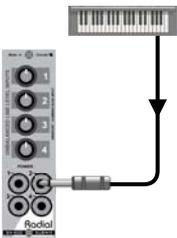

FOUR ¼"
FRONT PANEL
LINE INPUTS
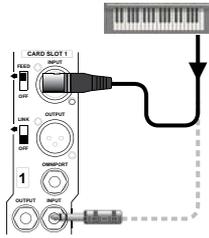
CHANNEL-1
REAR PANEL INPUT
(RADIAL WORKHORSE RACK)
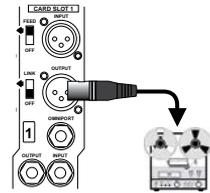
MIX OUTPUT
REAR PANEL OUTPUT
(RADIAL WORKHORSE RACK)

Omniport

If you are using the Submix in a Radial Workhorse power rack the Omniport feature will be available. In this instance with the Submix, the Omniport acts as a mixer expansion buss allowing additional Submix modules to link together to form larger configurations like 8x1, 12x1, etc. The easiest way to connect Submix modules would be with a standard ¼" patch cable from the first module's output to the second module's Omniport jack.

INPUTS 1~4

INPUTS 5~8

8x1 MIX OUT
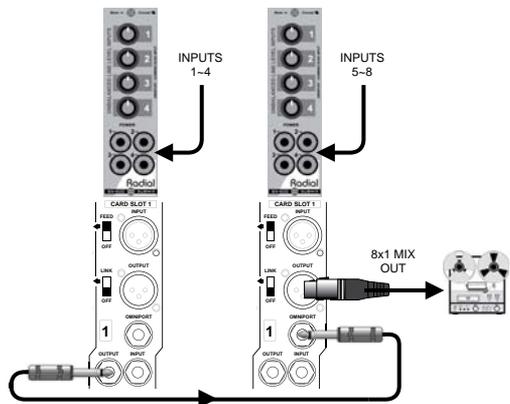
USING THE SUBMIX IN MONO

Using the Submix will be mostly the same no matter what source is connected so we have decided to use keyboards as the source to explain the functionality. Start by connecting the output from your first keyboard to input-1 on the Submix. You will note that the noise level will remain low at all levels. The Submix employs Radial's unique VaryState™ gain control that actually changes the sensitivity along with the gain. Set the level control completely counter-clockwise or off to start. Connect the output from the rear panel of your 500 series power rack to your recording system. Start playing increase the level slowly until you reach a comfortable listening level. Repeat for input-2.
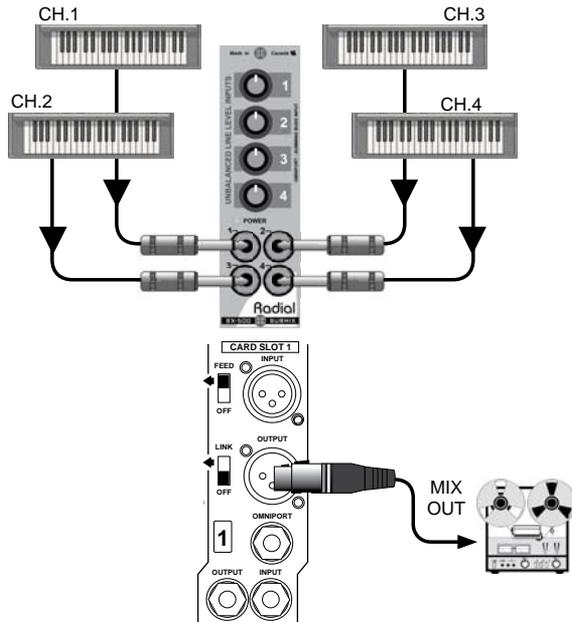
Connecting four mono instruments to the Submix

COMBINING SUBMIX MODULES TOGETHER FOR MORE CHANNELS

If you are equipped with a Radial Workhorse power rack, you can combine two or more Submix modules together to create larger mixers. Simply connect the TRS output from the first unit and plug it into the Omniport and the signal will automatically appear on the output buss to create an 8x1 mixer. Adding a third Submix will give you a 12x1 mixer. Combine these with a Workhorse Powerstrip, to can create a super compact 12x1 stage mixer!
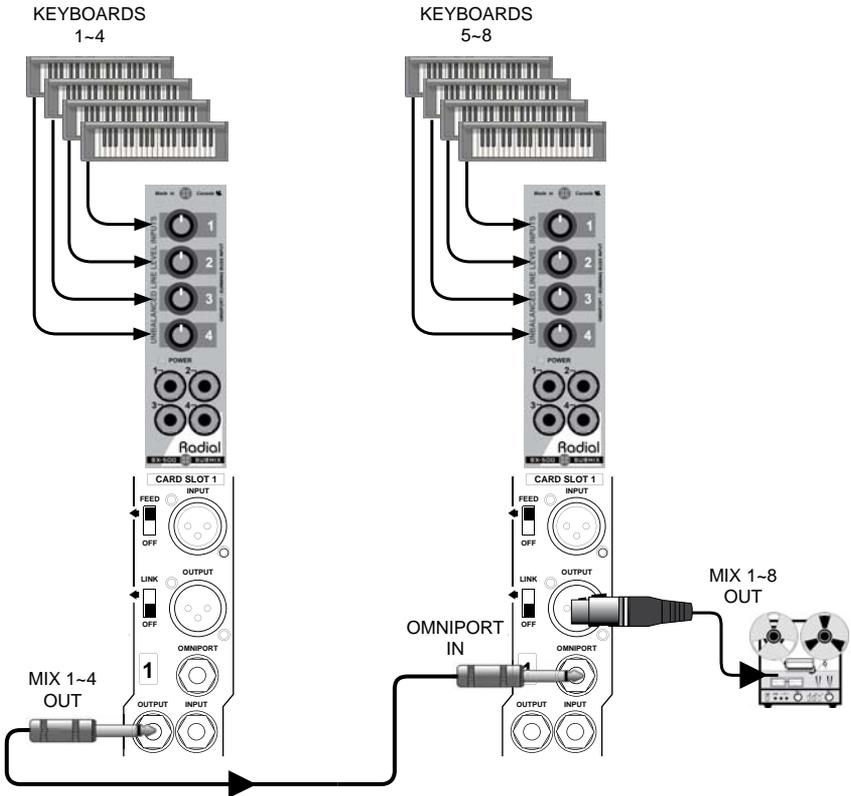
Two Submix modules tied together via Omniport configured for 8x1 mono output

COMBINING SUBMIX MODULES TOGETHER FOR STEREO

With two Submix modules, you can create a stereo setup by assigning the first Submix to left and the second Submix to right. When connecting, simply split the stereo signals to follow suit and you are set to go. This can provide your studio with a very efficient way of managing stereo sources such as playback tracks for overdubbing, mixing four stereo keyboards, or even be used to sum effects or channels together.
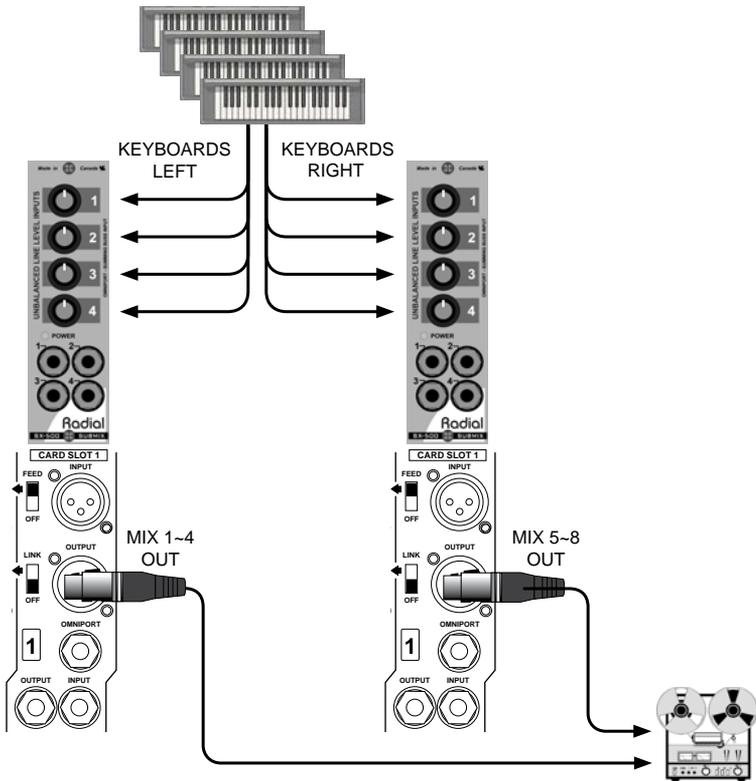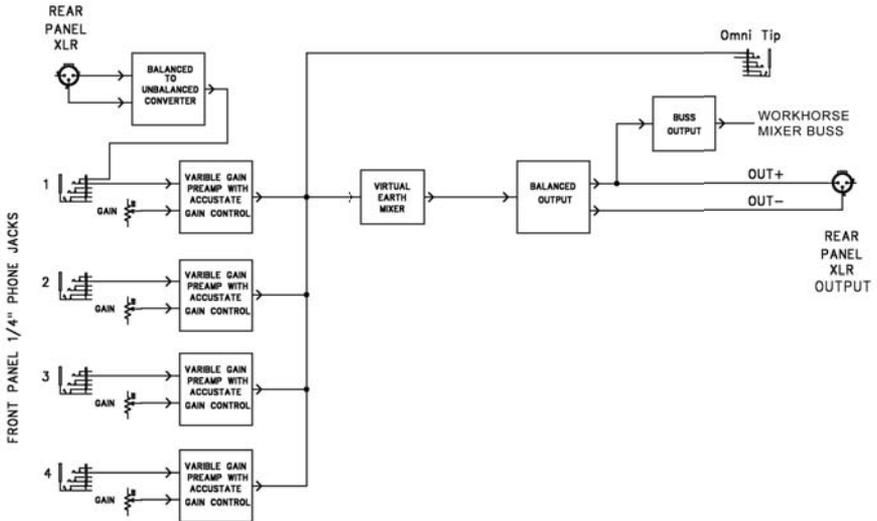

Two Submix modules configured 8x2 stereo output

RADIAL SUBMIX 500 SPECIFICATIONS

Circuit Type	High grade audio IC op-amps with Accustate gain control
Frequency response	20 Hz to 20KHz (+/- 0.5 dB)
Phase Response	<10 degree shift at 20KHz
Maximum Input	-2dBu/+12dBu
Maximum Output	+16dBu
THD + N	<0.005% (at 0dBu output)
Dynamic range	97dB (maximum input - noise floor)
Equivalent input noise	-103dBu (maximum gain - noise floor)
Noise	-85dBu (at maximum gain)
Gain	+18dB (at maximum gain)
Intermodulation Distortion	<0.006% (at 0dBu output)
Input Impedance	100K (unbalanced)
Output Impedance	300 Ohms
Omniport Function	Unity gain expansion buss input
Power requirement	+/- 16V (Workhorse or 500 series compatible power frame
Current draw	31mA
XLR Configuration:	Follows AES spec: pin-1 ground, pin-2 hot (+), pin-3 cold (-)
Size:	5.25" x 1.5" x 6.6" (13.34 x 3.81 x 16.75cm)
Weight:	0.7 lb (316 g)
Warranty:	3 years, transferable

RADIAL SUBMIX 500 BLOCK DIAGRAM

THREE YEAR TRANSFERABLE LIMITED WARRANTY

This product is intended for professional use only. The user should be familiar and experienced with the 500 series rack and module format.

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Specifications and appearance are subject to change without notice.

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