



PSC Active RF Matrix Rack™



Frequency Ranges:

“Single Band” 470Mhz to 700Mhz

“Dual Band” 470-618Mhz and Lectro Block 941 (940-960Mhz)

“Wide Band” 470Mhz to 960Mhz

- **Supports up to 16 Diversity Receivers**
- **Built in RF Distribution and Filtering**
- **Provides Remote Antenna Powering**
- **Made in the U.S.A.**

Operation Manual Version 1.0

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Thank you for purchasing your new PSC Active RF Matrix Rack. This new product provides low noise RF combining and RF distribution to all your RF receivers. This new design can be AC or low voltage (12V) DC powered.

PLEASE BE SURE THAT YOU HAVE READ AND UNDERSTOOD THIS ENTIRE OPERATIONAL MANUAL BEFORE OPERATING YOUR NEW PSC ACTIVE RF MATRIX RACK

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The PSC Active RF Matrix Rack contains built in low noise, high current RF amplifiers and distribution circuitry. The 16-way, RF splitters will feed high quality RF to your diversity receivers. This rugged device was developed using the latest super low noise RF amplifiers and is offered in several models that operate over the following frequency ranges:

Model #	Description:	Frequency Range:
MRFMRS	PSC Active RF Matrix Rack, "Single Band"	470-700Mhz
MRFMRD	PSC Active RF Matrix Rack, "Dual Band"	470-618Mhz and also 940-960Mhz
MRFMRW	PSC Active RF Matrix Rack, "Wide Band"	470-960Mhz

PRODUCT DESCRIPTION:

The PSC Active RF Matrix Rack is used to combine up to four (4) RF “Zones” and then distribute the RF signals to your wireless receivers. This device offers four sets of two BNC RF input connectors for ease of use in interfacing with your external antennas. Each of the four diversity BNC input connector pairs can be used for individual RF “Zones” and can be routed to the RF matrix using the front panel switches. In addition, each of the four diversity RF input pairs has a separate remote antenna power function available. This switchable power source can be used to power external powered antennas or remote line amplifiers.

There are five front panel mounted toggle switches on the unit. One is marked “MAIN POWER” and this controls the overall power to the unit. The remaining four toggle switches are marked as RF Zone 1, RF Zone 2, RF Zone 3, and RF Zone 4. Each of these four switches has three (3) possible settings. Each switch controls one of the four diversity RF input pairs. In the “DOWN” position, that individual diversity RF input pair is routed to the RF matrix for distribution to all your wireless receivers. In the CENTER position, that diversity RF input pair is switched off and is not routed to the RF matrix. In the “UP” position, that individual diversity RF input pair is routed to the RF matrix and has the remote antenna power turned on for feeding remote powered antennas or remote RF amplifiers. All four (4) of the switches are accompanied by panel mount LEDs for easy operation. Just to the right side of the switch monitoring LEDs is a RED LED that will light up if no diversity RF input pair has been selected. This provides a warning to the operator that no RF inputs have been selected.

Please note that you can use any combination of one or more of the four RF Input zones to feed your wireless receivers. For example, you can use Zone 1 only or Zone 2 only or Zone 3 only or Zone 4 only or any combination of multiple zones up to and including all four RF zones.

Toward the right side of the front panel, you will find RF signal strength meters for your use in helping determining overall RF signal strength that is being sent out to your RF receivers. These RF meters are useful for in-field RF trouble shooting.

To the farthest right side of the front panel, you will find the main power switch with RED power on indicating LED.

The entire unit is powered from any source of external DC power of 12Vdc at up to a maximum of approximately 800mA through the rear panel mounted 4 pin XLR power connection. The unit can also be powered from 90 to 240VAC for fixed installations.

On the rear of the unit there are four (4) sets of diversity RF input pair BNC connectors and sixteen (16) diversity RF output pairs of SMA connectors. These 32 SMA connectors provide RF output from the unit to feed up to 16 diversity receivers.

FRONT PANEL:



FRONT PANEL SHOWING: (left to right)

“RF Zone 1” diversity RF input pair routing and remote antenna power switch

“RF Zone 2” diversity RF input pair routing and remote antenna power switch

“RF Zone 3” diversity RF input pair routing and remote antenna power switch

“RF Zone 4” diversity RF input pair routing and remote antenna power switch

“No Input Selected” LED that indicates that no input RF channel pair has been selected

Dual RF Signal Level Meters

Main Power Switch

RF INPUT ZONE ASSIGNMENTS AND REMOTE ANTENNA POWER:

Each of the four (4) RF input zones can be independently selected and added to the RF signal that will be sent to your receivers. Each of these four diversity input pairs can be operated with or without remote antenna power being sent to your powered antennas or remote RF amplifiers. Please see the examples on the next page for a detailed explanation:



RF Input Zone Switches for Zones 1-4.

Switch Settings:

Center Position: Zone OFF, LEDs Off

Downward Position: RF Assigned, Remote Antenna Power OFF, GREEN LED On

Upward Position: RF Assigned, Remote Antenna Power ON, GREEN and YELLOW LEDs On



In this photo, No RF Input Zones Selected (all switches off).

Note that “No Input Selected LED” is ON to alert you that you have not selected any of the four RF Input Zones. No Remote Antenna Power Turned On



In this photo, All Four (4) Input RF Zones Selected



In this photo, RF Zones 1 and 2 Selected, Without Remote Antenna Power

And also RF Zones 3 and 4 Selected, With Remote Antenna Power

Please note that the GREEN LED indicated that the RF Input Zone has been selected and the YELLOW LED indicates that Remote Antenna Power has been applied to that RF input diversity pair (input Zone). Please also note that these same GREEN and YELLOW LEDs are also used on

the rear panel of the unit located right next to each RF input BNC connector for your convenience.



RF Inputs showing LEDs which Indicated which BNCs are active (RF Assigned) and which BNCs have Remote Antenna Power applied.

RF METERING:



RF Signal Level Meters

There are two RF signal level meters on the front panel of the PSC Active RF Matrix. These meters monitor the RF signal strength of the RF that is going out of the unit via the SMA connectors to your wireless receivers. They display signal levels from approximately -56dB up to +10dB. They can be used for overall RF signal monitoring while in normal use or for RF signal level monitoring while doing site setups. For example, if you want to test the RF signal strength of your various RF Zones before production starts for the day, you can switch on only that one particular RF zone and then use the meters to monitor that one RF zone. You can repeat this quick test for any and all other used zones, one zone at a time.

REAR PANEL:



REAR PANEL SHOWING: (left to right)

Four (4) BNC Diversity RF Input Channel Pairs with LED Monitoring

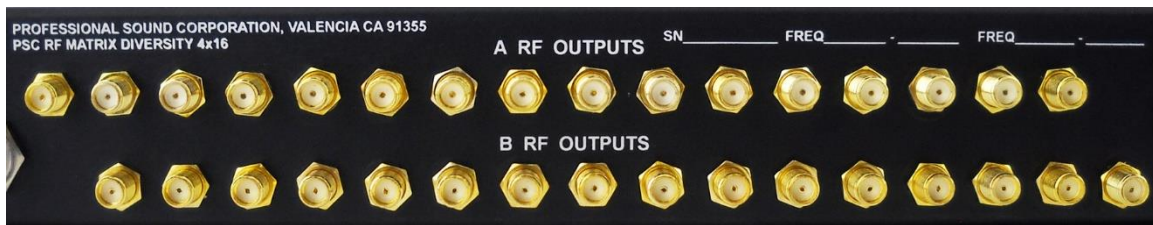
Sixteen (16) RF Diversity RF Output Pairs on SMA Connectors for Feeding Receivers

External DC Power Input (12Vdc nominal) on a 4 Pin XLR Male Chassis Connector

AC Power Receptacle



RF Input BNC Connectors with Status Indicating LEDs. GREEN = RF Input ON, YELLOW Indicates Remote Antenna Power is ON.



RF Output SMA Connectors. The Top Row is the "A" half of the RF Diversity Signal and the Bottom Row is "B" half of the RF Diversity Signal.

EXTERNAL POWER:

This unit can be powered from AC Line Voltage (90 to 240Vac) or from low voltage DC such as rechargeable batteries, DC power supplies or other sources. The DC input has a voltage range of 10 to 18Vdc. The unit draws approximately 800mA of current @ 12Vdc with no active antennas powered up. When operated with the maximum of eight (8) active, powered antennas, the unit will draw approximately 2 Amps @12Vdc.



DC Input on 4 Pin XLR, AC Input

RF CIRCUITRY DECRPTION:

Your new PSC Active RF Matrix Rack contains RF distribution designed to provide proper, clean RF distribution to your receivers. Each of the four (4) diversity RF inputs contains a built in DC bias circuit designed to be able to power external remote powered antennas and/or remote RF amplifiers and also super high quality RF switches that allow those individual RF input pairs to be assigned or not assigned to the RF mix. These high-quality RF switches provide more than 50dB of RF isolation when switched off. Each diversity RF section is summed using high quality RF combiners with typical rejection ratios of better than 27dB. An RF bandpass filter (various frequency ranges available) follows the RF combiner and is then followed by an RF limiter to help guard against RF overload. Two, very low noise, high current RF Amplifiers, and two RF splitters. Are used to feed the 16 SMA RF outputs. Each part of the RF circuitry also contains its own, dedicated power regulation circuit for better RF cross talk specifications. The circuit boards used in this product are special, 4-layer RF PCBs for maximum performance.



PSC Custom made 4-Layer RF Circuit Boards

RACK MOUNTING BRACKETS, ADJUSTABLE:



Normal, front mount rack bracket position



Reversed, rear mount rack bracket position



Reversed (rear mount) position and offset mounting for added cable and connector clearance

STEP BY STEP USE GUIDE:

- 1. Install your PSC Active RF Matrix Rack into your Sound cart using the rack brackets included with each unit. Please note that these rack rail brackets are reversible from front of unit to back of unit and can be installed with the rack unit flush to the rack face or recessed simply by changing the screw rack mounting bracket screw locations. Alternatively, you can use Velcro to mount the unit to a shelf on your sound cart if it is not equipped with rack rails.**
- 2. Connect your remote antenna cables to the various diversity input pairs using the BNC connectors and high-quality RF cables. We recommend that you use RG-8/X cable for cable lengths up to about 25 feet (8 meters). We recommend that you use RG-8 cable for lengths over 25 feet. When using remote, powered antennas or remote line amplifiers, make sure to flip the RF input switch on the front panel to the "UP" position. You can verify that that individual BNC RF antenna input has remote power applied to it by seeing the Yellow LED lit up next the BNC connector. "Antenna" power switch. If you are not using remote powered antennas or remote RF amplifiers, flip the switch to the "down" position so that no remote antenna power is applied to your RF input cables.**
- 3. Connect either a 12 VDC power source to the 4 pin XLR external power connector or connect the unit to AC power using the AC power receptacle.**
- 4. Connect up to 16 diversity receivers by connecting short RF interconnect cables from the SMA outputs of the PSC Active RF Matrix to the SMA or BNC RF inputs on your specific receivers. Typically, these RF interconnect cables are less than 2 feet (0.6meter) long and can thus be made with various small diameter RF cable if desired as the loss through these short cables is negligible. We typically suggest using RG-58, RG-8/X or the smaller RF cables such as RG-174 or RG-316.**
- 5. Power up the unit. Note that the power switch lights up RED when the unit is turned on.**
- 6. Select your diversity RF input pairs of antennas based on your particular circumstances. For example, the actors are only in "Zone 1", so only turn on "Zone 1". If the actors are in Zones 1, 3 and 4, then turn on Zones 1, 3 and 4.**

CONNECTOR PINOUTS

External DC Power: Pin 1 = Ground
Pin 4 = +12Vdc (10-18Vdc)

SPECIFICATIONS:

Size: 17.5" x 6.5" x 1.75" (44.5cm x 16.5cm x 4.5cm)

Weight: 3.5 Lbs. (1.6Kg)

Power: External DC, 10 to 18Vdc, Nominal 800mA, 2A maximum
AC Power, 90-240Vac @ 30 Watts

RF Input Connectors: BNC Chassis (x8)

RF Input Impedance: 50 Ohms

RF Output Connectors: SMA Chassis (x32)

RF Output Impedance: 50 Ohms

Maximum Input Signal: +13dB

Noise Figure: 0.8dB

Matrix Switching Cross Talk: > 50dB

Chassis Material: Aircraft Aluminum

Chassis Finish: Black Anodize, Type II

Warranty: 1 Year, limited

TERMS OF USE:

THE IMPROPER CONNECTION OF THIS RF COMBINER/SPLITTER TO AUXILIARY EQUIPMENT MAY RESULT IN DAMAGE TO SAID EQUIPMENT AND/OR PERSONAL INJURY. THIS PRODUCT IS DESIGNED TO BE OPERATED BY PROFESSIONALS IN THE FILM AND TELEVISION INDUSTRIES. THE PSC ACTIVE RF MATRIX RACK SHOULD ONLY BE OPERATED AFTER READING AND UNDERSTANDING THIS ENTIRE INSTRUCTION MANUAL. THE OPERATOR OF THIS DEVICE ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR PROPER USE AND OPERATION OF THIS EQUIPMENT! PROFESSIONAL SOUND CORPORATION AND/OR ITS EMPLOYEES AND OFFICERS ASSUME NO RESPONSIBILITY OR LIABILITY FOR PERSONAL AND PROPERTY DAMAGE INCURRED DUE TO ACCIDENT, CARELESS HANDLING, ABUSE OR MISSUSE, IMPROPER CONNECTION, AND/OR INSTALLATION, IMPROPER ELECTRICAL CONTACT OR GROUNDING. OWNERSHIP AND/OR USE OF THE PSC ACTIVE RF MATRIX RACK CONSTITUTES AGREEMENT WITH THESE TERMS.

Limited Warranty Certificate

Professional Sound Corporation warrants the PSC Active RF Matrix Rack, to be free from defective material and workmanship for a period of one year from the original date of purchase and agrees to repair or replace such defective parts or the whole product at its option, provided that the equipment is returned to Professional Sound Corporation. Shipping and insurance costs to and from Professional Sound Corporation must be prepaid by the owner. This warranty does not cover damage due to accident, careless handling, abuse or misuse, improper connection and/or installation, improper electrical contact, excessive RF levels or improper grounding. This warranty will be null and void in the event of removal, alteration or tampering with the serial number, or by service or repair work not performed by Professional Sound Corporation. Proof of purchase date (copy of invoice or Warranty Certificate) must be furnished before warranty service will be performed. This warranty is in lieu of any other warranty, expressed or implied, including warranties without limitation, products being merchantable at the time of purchase or suitable for a particular purpose. This warranty does not extend to, or include consequential damage.

DECLARATION OF CONFORMITY

STANDARD: EN 60065.2012 Power, Safety
EN 55032.2012 Part 1, Emissions
EN55032.2012 Part 2, Immunity

PSC

MODEL: Active RF Matrix Rack

RESPONSIBLE PARTY: Professional Sound Corp.
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CONTACT PERSON: Ronald Meyer
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TYPE OF PRODUCT: Antenna Distribution

MANUFACTURER: Professional Sound Corp.
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We hereby declare that the equipment bearing the trade name and model number listed above has been tested in accordance with the requirements contained in the above listed directives. All necessary steps have been taken and are in force to assure that production units manufactured will conform to Directive guidelines.

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