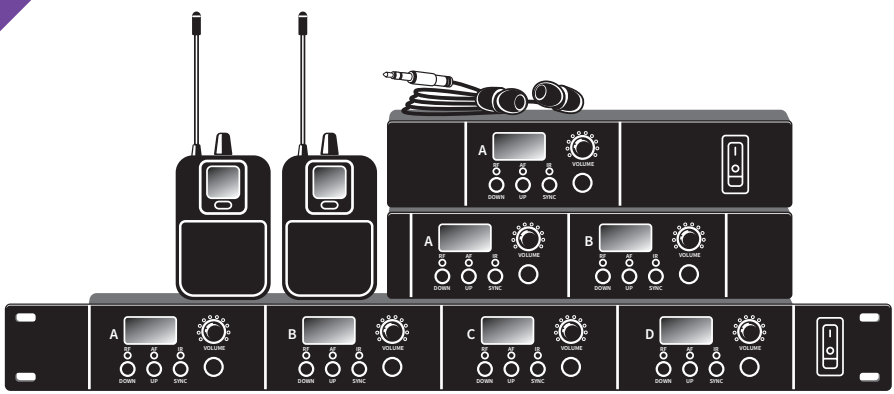
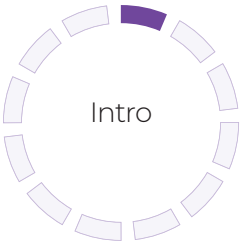
NADY SYSTEMS

PEM-01
PEM-02
PEM-04
WIRELESS SYSTEMS

OWNERMANUAL



NADY.COM
(510) 652-2411
SUPPORT@NADY.COM



Thank you for purchasing the NADY PEM Series In-Ear Monitor System.

Your system offers all the advantages of wireless in-ear monitoring mobility, such as a personalized mix and listening level, freedom from feedback and the long-term health benefits of safe listening levels. The PEM Series In-Ear Monitor Systems feature advanced PLL frequency synthesized UHF technology with 16 user-selectable frequencies providing clear channel operation on the UHF 900MHz band to give you interference-free performance for any application or locale.

This booklet provides comprehensive instructions for the operation of your PEM Series System. Please read the instructions completely before operation. Also included in this manual are system specifications, a Precautions & Troubleshooting section, and where/ how to receive Nady customer service and support.

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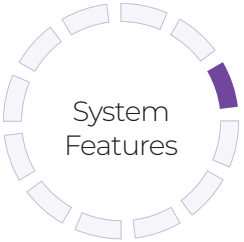


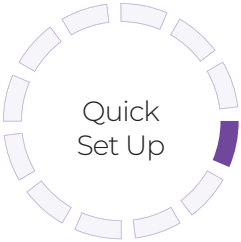
TRANSMITTER

The Nady PEM includes several user-friendly features...

- Clear signal operation in the 900 MHz Band, completely free from TV interference
- Reliable long-range operation (up to 300 feet line-of-sight)
- Sturdy metal housing
- Front panel AF / RF LED's for monitoring RF signal and audio levels
- Backlit display indicating operating frequency
- Sync function for easy frequency matching
- Power switch and headphone monitor volume control(s)
- Back Panel: Unbalanced ¼" line level inputs per channel (2 inputs for PEM-01 model), a single XLR SUM input, a second ¼" SUM input (04 model only), DC input jack and 2 BNC antenna jacks
- Externally powered with the included switching regulated adapter (PEM-01 & 02: 12V/1000mA, PEM-04: 12-18V/1500mA)

RECEIVER(S)

- Large volume control knob for adjusting monitoring level
- 3.5mm (1/8") headphone jack for use with the either the included EB-6 earbuds or your favorite pair
- 3.5mm (1/8") line out jack for the optional use of a recording device
- Power and manual channel select button
- RF LED to visually monitor connection
- Battery compartment for two AA Alkaline batteries providing up to 11 hours of continuous use (not included)



STEP 1

Take your system components out of the box and let's get started!

Note: several components in this manual are mentioned in both singular and plural because each transmitter base unit features either 1, 2 or 4 transmitters and accompanying receivers. Depending on your system, you will either have one or more of each.

STEP 2

Secure the antenna(s) to the transmitter base unit. Each base unit has both front and back antenna mounting capabilities. If you choose to mount the antennas to the front of the unit (recommended if rack mounting), please use the included rack ears (PEM-01 & PEM-02) and the BNC extension cables.

STEP 3

Take the receiver(s) out of the box and insert two AA batteries into each while carefully observing the correct polarity. Plug in the included EB-6 headphones into the bodypack's headphone output jack which is indicated by the headphone symbol.

STEP 4

Plug one end of the included AC power supply into the transmitter's back panel power input jack and the other end into a wall outlet.

STEP 5

Connect your audio source to the inputs on the back of your transmitter(s). [CAUTION: First make sure bodypack's volume knob(s) is turned down]. Turn on the transmitter using the main power switch.

STEP 6

Turn on the bodypack receiver by holding the main button for one second. The receiver's red "LO" LED will give a single quick flash, indicating that the receiver is powered on and ready for operation. In the case of a low battery, the "LO" LED will begin to flash, indicating that the batteries should be replaced with fresh ones. To preserve battery life, turn the receiver off when not in use by pressing and holding the main button for two seconds.

STEP 7

Before an audio signal can be received from the transmitter both units must be set to the same channel. This can be achieved manually by pressing the bodypack receiver's main button to enter the channel cycle mode. Press the button again to cycle upward through all 16 channels (0-9 and then A-F) until the desired channel is reached. Alternatively, an infrared sync function allows you to quickly sync the two units to the same channel automatically. More details about this feature can be found in the SYSTEM OPERATION portion of this manual.

Your system is now ready to use. You can use the SUM input(s) in conjunction with the individual unbalanced line inputs to transmit two audio sources simultaneously, providing a higher level of versatility. Audio applied to the SUM input(s) will be transmitted to all receivers.

TRANSMITTER

POWERING ON THE TRANSMITTER(S)

Plug in the provided AC/DC adapter to the DC input jack [9] on the back of the transmitter base unit. Then plug in the power supply to an AC outlet. Flip the power switch [1] to turn on the transmitter. The backlit LCD display(s) [2] and the green “RF” LED(‘s) will light up indicating that the transmitter(s) is operational.

CONNECTING THE AUDIO INPUT(S)

The PEM Series has two types of inputs, either 2 or 4 individual unbalanced ¼” input(s) (depending on your system) [10], and a single balanced XLR input [11] providing one audio source to all channels. NOTE: In the case of the PEM-01 and PEM-02, two unbalanced ¼” inputs along with a single balanced XLR input provide three separate audio sources. In the case of the PEM-04, an additional unbalanced ¼” SUM input is available for additional versatility.

The front panel of each transmitter has a dedicated ¼” headphone jack [8] and independent volume control [7] for monitoring the transmitted audio without affecting the transmitted audio level.

LED INDICATORS

The PEM Series features both green RF (Radio Frequency) LED’s and red AF (Audio Frequency) LED’s on each transmitter. The green LED’s light up when the transmitter is turned on, indicating RF transmission. The red LED’s indicate the presence of a signal.

CHANGING CHANNELS VIA THE TRANSMITTER(S)

Each transmitter features a liquid crystal display and three buttons (Down [5], Up [4] & Sync [6]). An auto-lock feature prevents the accidental changing of channels and can be disengaged by simply holding the “down” or “up” button for 3 seconds. Once disengaged, the currently selected channel will begin to blink. You can then cycle up or down through the system’s 16 channels (0-9 & A-F) using the “down” & “up” buttons. Once a new channel is selected the display will return to the auto-lock position. The Sync button [6] engages the transmitter’s infrared (IR) LED [3], allowing you to sync the bodypack receiver(s) to the newly selected channel. This is accomplished by pointing the receiver’s IR window (located inside the bodypack’s battery compartment) directly at the transmitter’s IR LED [3] immediately after engaging the transmitter’s Sync button [6].

ANTENNA(S)

Each PEM system includes detachable antenna(s) which must be connected to the transmitter's antenna jack(s) [12] before operation. Optimal antenna positioning is at 45 degrees from horizontal and, in the case of the PEM-04, at 90 degrees from each other. For maximum range, it's always best to maintain line-of-sight (no obstructions) between the transmitter antenna(s) and the receiver(s) whenever possible.

[1] Power Switch

[2] Backlit LCD Display

[3] Infrared (IR) LED

[4] Up Button

[5] Down Button

[6] Sync Button

[7] Headphone Monitor Volume

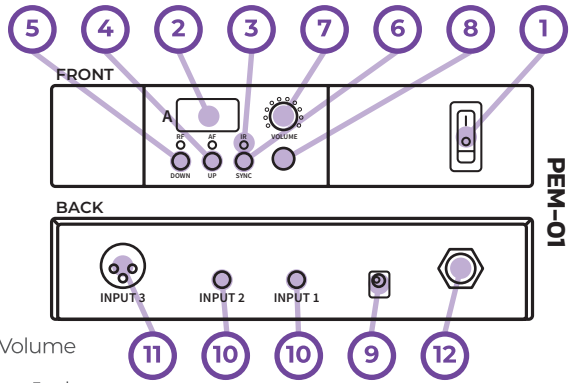
[8] ¼" Headphone Monitor Jack

[9] DC Power Jack

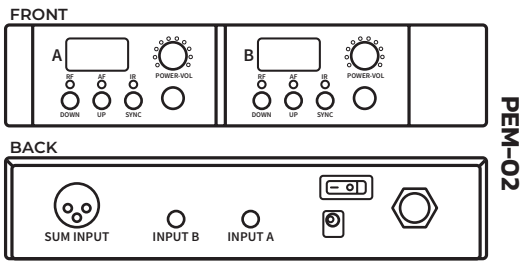
[10] Unbalanced ¼" Input

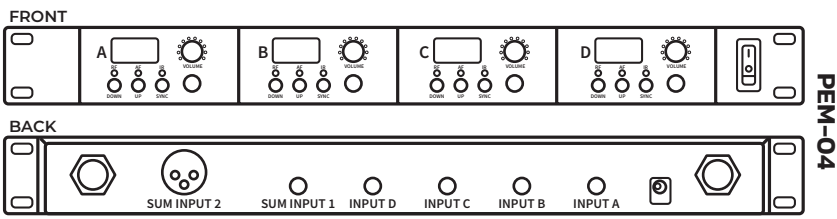
[11] Balanced XLR Input

[12] Antenna Jack



The **PEM-01** part indicators apply to **PEM-02** and **PEM-04**





RECEIVER

BATTERY INSTALLATION

Open the hinged battery compartment door and insert 2 fresh AA alkaline batteries while observing the correct polarity [16]. Fresh alkaline batteries can last up to 11 hours in use, but in order to ensure optimum performance, it is recommended that the batteries be replaced after 8-10 hours. Remove the batteries completely when not in use for extended periods of time.

POWERING ON THE PEM RECEIVER

Turn on the PEM receiver(s) by pressing and holding the main button for one second [17]. The battery indicator "LO" LED [14] will flash once when turned on, confirming that the batteries are in good health and the receiver is powered on. When the batteries become low, the "LO" LED will begin to flash, indicating that new batteries are required. TIP: Always change both batteries when the "LO" LED begins to flash. When the receiver and transmitter are set to the same RF channel, they are paired, and the receiver's green "RF" LED will light up, indicating that it is connected and ready to receive the incoming audio transmission. To turn off the receiver, simply press and hold the main button for two seconds.

USING THE PEM RECEIVER

Insert the included EB-6 headphones into the 3.5mm headphone jack indicated by the headphone symbol on the top of the receiver [19]. [**CAUTION:** First make sure the bodypack's headphone volume knob [18] is turned down]. The PEM series systems feature an infrared auto-sync function, whereby pressing the "sync" button [6] on the front of the transmitter will allow you to automatically sync the transmitter to the bodypack using the "sync" window [15] on the inside of the bodypack's battery compartment [16]. Hold the bodypack's "sync" window [15] in front of the transmitter's IR LED [3] for two seconds to pair. Alternatively, a manual channel change can be achieved by quickly pressing the receiver's main button [17] to enter the channel cycle mode. Once entered, the LED display [14] will begin to blink. Press the button again and the receiver will cycle upward through all 16 channels of the system (0-9 and then A-F). Select the corresponding number or letter of the channel you wish to monitor. This is a particularly useful feature which allows the listener to quickly change to any of the other transmitted signals (PEM-02 & PEM-04 only). All PEM Series bodypacks feature a 3.5mm line output jack [20] located at the top of the bodypack which can be used with a recording device. Use the removable belt clip [21] to secure the bodypack to the performer.

[13] Antenna

[14] LED Display

[15] Infrared (IR) Window

[16] Battery Compartment

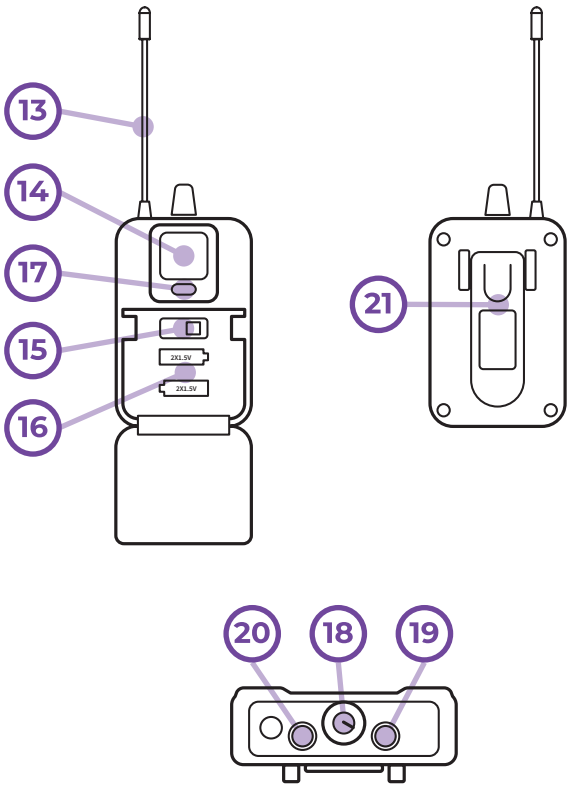
[17] Main Button

[18] Headphone Volume

[19] 3.5mm Headphone Jack

[20] 3.5mm Line Out

[21] Removable Belt Clip



PRECAUTIONS & TROUBLESHOOTING

• The PEM systems are multi-frequency systems operating in the 902 – 928MHz band. When preparing for an event in a public space, to avoid potential interference, first confirm there are no other wireless systems operating in the immediate vicinity and in the same frequency band as your PEM system. If you find that there are, you should coordinate frequencies with the other user(s) to make sure your systems do not interfere with each other.

• The transmitter antennas should be kept away from any metal surfaces whenever possible as they can reflect away or shield the outgoing RF signal.

• If the audio source volume is set too high, it may overdrive the input of the transmitter, causing distortion. Conversely, if the audio source is set too low, the overall signal-to-noise ratio of the system will be reduced, causing noticeable hiss. If this occurs, adjust the input level of the audio source so that the highest sound pressure level going into the transmitter causes no input overload, but permits the receiver level control to operate in the normal range (not too high and not too low). Doing this will provide the optimal signal-to-noise ratio.

• Make sure to insert the batteries according to the polarity clearly marked on the transmitter. Use only new AA alkaline or fully recharged NiMH batteries. Do not use “general purpose” carbon batteries. When batteries are weak, replace all of them at the same time.

• For best operation, the transmitter and the receiver(s) should never be closer than 3ft. (1m) as that may overload the receiver’s input circuitry and cause interference. The transmitter should be placed at least 3ft. (1m) above the ground and 3ft. (1m) away from a wall or metal surface. Try to keep the transmitter’s antennas and the receivers away from RF noise sources such as motors, automobiles, neon lights, signal processors, computers, as well as large metal objects. Position the transmitter so that there are the least possible obstructions between its antennas and the receiver(s). Line-of-sight is best!

• If rack-mounting the transmitter, keep away from heat sources such as amplifiers and always allow enough space between rack units for adequate airflow and heat dissipation

• Turn all receivers off when not in use. For longest life, remove the batteries if the system is not to be used for an extended period of time.

USEFUL TIPS

BODYPACK PLACEMENT

• Care should be taken regarding bodypack placement to ensure the best reception from the transmitter. If the transmitter is behind you while performing, the bodypack should therefore be secured to your back. If the transmitter is on your right, the bodypack should be secured to your right side, and so on. It is always best to try to maintain line-of sight between the transmitter and the receiver.

NO OR LOW AUDIO

• If you are not getting audio through the system, and you have confirmed that your system is working properly, check all connections and settings as well as receiver battery life and polarity. The receiver's volume is adjustable so make sure the receiver's volume is set properly.

***NOTE:** Each transmitter channel should be set to a different frequency. Never set two transmitter channels to the same frequency as they will cause each other interference resulting in poor or no audio.

• Unlike the bodypack receivers which can be set to the same channel, multiple transmitters should not be set to the same channel as this will cause self-interference and will result in distorted or no audio regardless of whether or not multiple audio sources are used. To avoid this, be sure to set each transmitter to a different channel before operation (PEM-02 & PEM-04 only).

SPECIFICATIONS

OVERALL SYSTEM PERFORMANCE

Frequency Response:	60Hz – 17kHz ± 3dB
Dynamic Range:	98dB
Total Harmonic Distortion:	<0.5% @ 1kHz
Noise Floor:	95dB (A Weighted)
Headroom:	17dB
Operating Range:	Up to 300' (91m) Line of Sight
RF Carrier Frequency Range:	902 – 928MHz

TRANSMITTER

RF Power Out:	50mW
Frequency Stability:	± 0.005%
Modulation:	FM
Transmission Method:	Mono
Frequencies:	16
Spurious Emissions:	>60dB
Deviation:	<20kHz
Display:	Backlit LCD
Audio Inputs:	PEM-01: 2 x Unbalanced ¼" Line Level, 1 x Balanced XLR SUM
	PEM-02: 2 x Unbalanced ¼" Line Level, 1 x Balanced XLR SUM
	PEM-04: 4 x Unbalanced ¼" Line Level, 1 x Balanced XLR SUM, 1 x Unbalanced ¼" SUM
Antennas:	8.5"(21.5cm) Detachable Rear-Mount / Optional Front Mount
Power Requirements:	PEM-01: Regulated DC 12V/1000mA 21mm center positive barrel plug
	PEM-02: Regulated DC 12V/1000mA 21mm center positive barrel plug
	PEM-04: Regulated DC 12-18V/1500mA 21mm center positive barrel plug
Weight and Dimensions:	PEM-01: 2.2lbs (0.9kg) / 8.25" x 7.125" x 1.75" (21cm x 18cm x 4.4cm)
	PEM-02: 2.2lbs (0.9kg) / 8.25" x 7.125" x 1.75" (21cm x 18cm x 4.4cm)
	PEM-04: 3.9lbs (1.7kg) / 19" x 7" x 1.75" (48cm x 17.7cm x 4.4cm)

RECEIVER

Output Impedance:	16Ω
Audio Outputs:	3.5mm Dual Mono Headphone, 3.5mm Line Out
Weight and Dimensions:	2.4oz (68g) / 2.375" x 1" x 4.25" (6cm x 2.5cm x 10.8cm)
Power Requirements:	2 x AA Alkaline
Battery Life:	Up to 11 Hours

WARNING: The FCC mandates that the following information be provided to all users of wireless equipment:

CONSUMER ALERT

Most users do not need a license to operate this wireless microphone system. Nevertheless, operating this microphone system without a license is subject to certain restrictions: the system may not cause harmful interference; it must operate at a low power level (not in excess of 50mW); and it has no protection from interference received from any other device. Purchasers should also be aware that the FCC is currently evaluating use of wireless microphone systems, and these rules are subject to change. For more information, call the FCC at 1-888-CALL-FCC (TTY: 1-888-TELL-FCC) or visit : www.fcc.gov/cgb/consumerfacts/wirelessmic_factsheet.html

Please note that wireless frequencies are shared with other radio services. According to FCC regulations, wireless microphone operations are unprotected from interference from other licensed operations in the band. If any interference is received by any Government or non-government operation, the wireless microphone must cease operation or change frequencies. The above statement is valid only for use in the U.S.A. If you encounter slight receiving interference when the transmitter is far from the receiver (from other than an operating TV station on the same frequency), it can often be overcome by relocating the receiver to a different place, away from RF sources, e.g., TV, radio, computer, electric motors.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications to this equipment not expressly approved by Nady Systems may void the user's authority to operate this equipment.

WARRANTY

Nady Systems warrants to the original consumer purchaser (U.S.A. only) that your unit is free from any defects in material or workmanship for a period of one year from the date of purchase. If any such defect is discovered within the warranty period, Nady Systems will repair or replace the unit free of charge, subject to verification of the defect or malfunction upon delivery or shipping prepaid to Nady Systems. This warranty does not apply to defects or physical damage resulting from abuse, neglect, accident, improper repair, alteration, or unreasonable use of the unit resulting in cracked or broken cases or parts, or units damaged by excessive heat, and does not apply to batteries or damage caused by leaking batteries. This warranty does not cover finish or appearance of items nor items damaged in shipment en route to Nady Systems for repair.

SERVICE INFORMATION

In the U.S.

If you are experiencing operational problems with your system, please refer to the Support page at www.nady.com or contact the Nady Service Department via e-mail to support@nady.com for assistance.

Outside the U.S.

For service or warranty matters please contact the Nady distributor in your country through the dealer/store from which you purchased this product.

DO NOT ATTEMPT TO SERVICE THIS SYSTEM BY YOURSELF AS IT CAN BE DANGEROUS AND WILL ALSO VOID THE WARRANTY.

NADY SYSTEMS

CALIFORNIA USA
NADY.com

NADY.COM
(510) 652-2411
SUPPORT@NADY.COM

V12020