

UWM-2

DUAL CHANNEL UHF
WIRELESS
LAVALIER
MICROPHONE


POLSEN®



PRODUCT
MANUAL

THANK YOU FOR CHOOSING POLSEN.

The Polsen UWM-2 is a camera mountable 100-channel UHF wireless system that can transmit audio up to 300 feet. This wireless mic system is engineered with professional features like headphone monitoring, line input, and frequency agility, which make it ideal for video applications such as interviews, lectures, dialog, and conferences. You can choose from 100 channels to avoid interference. Up to four UWM-2 systems can be deployed simultaneously in the same location. Whether you're using a camcorder, DSLR camera, or portable recorder, you'll capture pristine and broadcast-quality audio.

The receiver features a line output and included 2-channel XLR cable for professional cameras. It also includes a cable for recording your audio to a DSLR, consumer camcorder, or smartphone that has a 1/8 in. (3.5 mm) mic input. The system's transmitter features a gain control that ensures an optimum signal level for the receiver. It's also equipped with a line input that enables the transmission of such devices as an audio mixer, smartphone, or portable recorder.

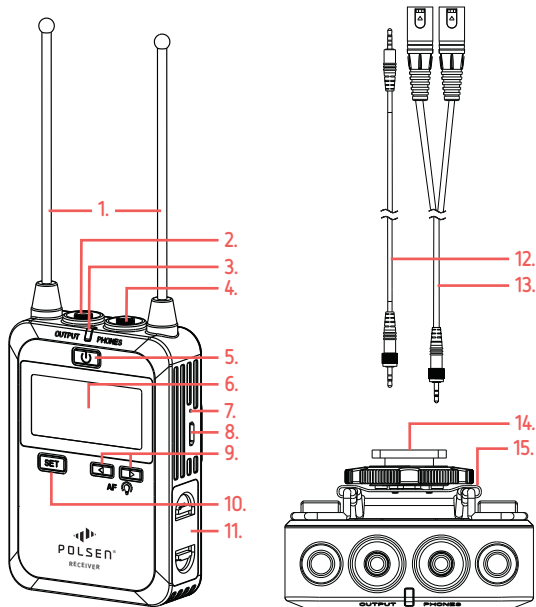
This wireless microphone system operates in the UHF 500 MHz bandwidth, assuring less susceptibility to interference than VHF systems and greater reliability at longer distances. Operating in this bandwidth also ensures that the UWM-2 system is future proof and meets current and known future FCC regulations.

PRECAUTIONS

- Exposure to high sound levels can cause permanent hearing loss. Avoid listening at high volumes for extended periods of time.
- Keep this unit away from water and any flammable gases or liquids.
- Handle this product with care.
- Clean this product with only a soft, dry cloth.
- Keep this product away from children.
- Use only parts provided by the manufacturer.
- All images are for illustrative purposes only.

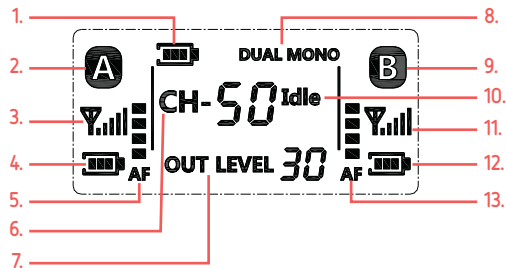
RECEIVER

1. Antennas
2. Audio output
3. Power indicator
4. Headphone output
5. Power button
6. LCD screen
7. Charging status indicator
8. USB Micro-B charging port
9. Left and right buttons
10. Set button
11. Battery compartment
12. 1/8 in. (3.5 mm) TRS to TRRS cable
13. 1/8 in. (3.5 mm) TRS to dual XLR cable
14. Shoe-mount adapter with 1/4-20 socket
15. Belt clip



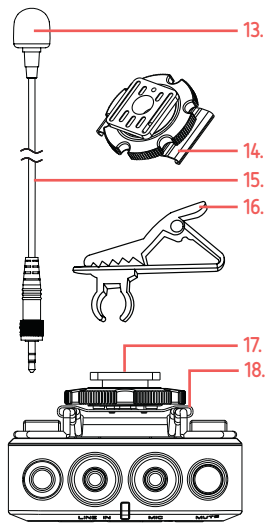
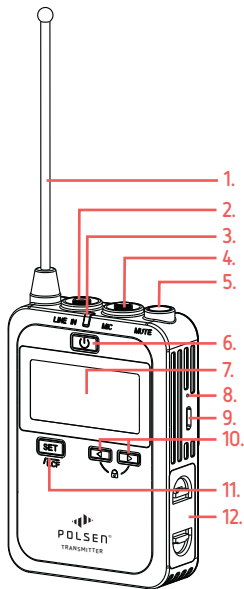
LCD SCREEN (RECEIVER)

1. Battery indicator
2. Transmitter status indicator (Channel A)
3. RF reception indicator (Transmitter A)
4. Battery status (Transmitter A)
5. Audio level meter (Transmitter A)
6. Channel indicator
7. Output level indicator
8. Audio output mode indicator
9. Transmitter status indicator (Channel B)
10. Channel status indicator
11. RF reception indicator (Transmitter B)
12. Battery status (Transmitter B)
13. Audio level meter (Transmitter B)



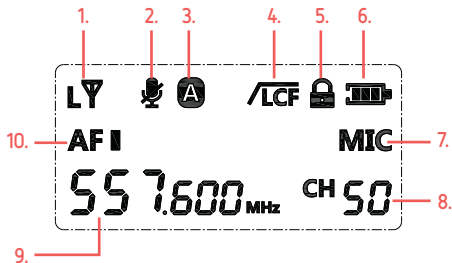
TRANSMITTER

1. Antenna
2. Line level input
3. Power indicator
4. Mic level input
5. Mute button
6. Power button
7. LCD screen
8. Charging status indicator
9. USB Micro-B charging port
10. Left and right buttons
11. Set button
12. Battery compartment
13. Foam windscreen (×2)
14. Shoe-mount adapter with 1/4-20 socket
15. Omnidirectional lavalier microphone (×2)
16. Tie clip (×2)
17. Shoe mount
18. Belt clip



LCD SCREEN (TRANSMITTER)

1. RF transmission power indicator
2. Mute indicator
3. Transmitter channel selector
4. Low-cut filter
5. Function lock
6. Battery indicator
7. Mic / Line indicator
8. Frequency channel selector / Input level (Gain)
9. Frequency indicator
10. Level meter



INSTALLING THE BATTERIES

Transmitter and Receiver

The transmitter and receiver are each powered by two AA batteries. To install the batteries, follow these steps.

1. Make sure the units are turned off by pressing and holding the power button on all units.
2. Pinch the battery compartment tabs together, and the compartment door will pop open.
3. Insert fresh batteries, following the orientation diagram on the back of the unit.
4. Press the compartment door down over the batteries until it locks into place.

Rechargeable Batteries

You can use rechargeable AA batteries with the receiver and transmitter.

To recharge: Place them in the battery compartment and connect the receiver or transmitter to a powered USB port or charging device with a Micro-USB to USB Standard-A cable (not included).

Charging status indicator:

RED Charging in progress

GREEN Charging complete

Important! Do not attempt to recharge non-rechargeable batteries—this may result in damage to the unit and void the warranty.

Tip: Before you record, insert fresh batteries into the transmitter and receiver. Have spare fresh batteries on hand during a session. If you're using rechargeable batteries, bring extra batteries and a battery charger with you.

MOUNTING

The transmitter and receiver can be worn attached to a belt or mounted on a camera, or attached to a tripod or articulating arm.

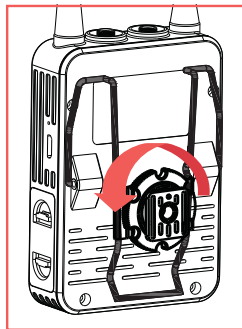
Belt Clip

Attach the included belt clip by pinching the two ends together and inserting them into the holes on the back of the unit.

Shoe Mount

The transmitter and receiver can be attached to your camera with the shoe-mount adapter. You can also move the unit off your camera by attaching it to the shoe mount that's built into many ring lights, LEDs, and articulating arms.

1. Attach the shoe-mount adapter by fitting the two hooks over each side of the belt clip's center section.
2. Loosen the shoe-mount adapter's locking wheel by turning it clockwise, and slide it into the shoe mount. Make sure it's fully inserted, then turn the locking wheel counterclockwise to tighten until it's secure.



Tripod Mounting

If you prefer a secure stationary place for the transmitter or receiver, mount it to an accessory with a 1/4-20 mounting screw like a tripod or light stand.

1. Follow the instructions above for attaching the shoe-mount adapter.
2. Use the 1/4-20 socket on the shoe-mount adapter to screw the unit onto a tripod or light stand that has a 1/4-20 mounting screw.

BEFORE YOU BEGIN

The UWM-2 Dual Channel Wireless System is intuitive and easy to operate.

If you choose to begin using the system before reading the operating instructions, follow these operating tips:

Channel Selection

The transmitters and the receiver must all be set to the same channel number whether the transmitters are set to transmitter channel A or B.

See *Setting the Receiver Channel* and *Setting the Transmitter Channel* below.

Locking Connectors

To ensure the cables are not disconnected from the UWM-2 during a recording or performance, the included cables have locking 1/8 in. (3.5 mm) connectors.

Make sure to attach the plug with the locking connector to the transmitter and receiver.

Fully insert the plug into the jack, and turn the locking collar clockwise until secure. Don't overtighten the locking connection.

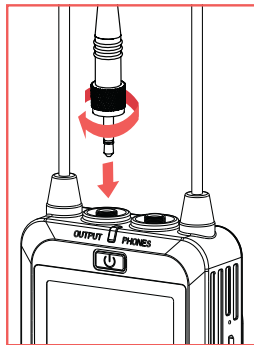
OPERATING RANGE

Each transmitter has a normal operating range of 150 ft. (45.7 m), and 300 ft. (91.4 m) in optimum conditions.

An intermittent or weak signal can be an indication that you have reached the maximum operating distance. The operating range can change depending factors such as weather, atmospheric conditions, terrain, obstructions, and battery power.

If you notice signal intermittence, dropouts, or decreased volume.

1. Move the transmitters closer to the receiver.
2. Eliminate obstructions to the line of sight between transmitters and receiver.
3. Check the battery power in the transmitters and receiver. If the battery power is low, replace or fully recharge the batteries.



INTERFERENCE

Radio Frequency (RF) or Electromagnetic (EM) interference can cause buzzing or humming, noise bursts, pops, clicks, and dropouts.

The channel status indicator shows whether a channel is usable, or if it has interference that can affect your audio. See *Finding an Interference-Free Channel* below.

If the channel status indicator shows channel interference, or if interference develops while the system is in use, change the transmitters and receiver channel:

Important! The transmitters and the receiver must all be set to the same channel.

To avoid interference:

1. Turn off smartphones, walkie talkies, and computers in the area.
2. Try to avoid areas where there are high-voltage power cables for lighting and sound equipment.
3. Improve the line of sight between the transmitters and the receiver.
4. If the receiver is inside a metal equipment rack, move it a location where it isn't surrounded by metal.

Play/pause, volume control, and forward and back track selection can be controlled from the front panel or from the remote.

CONNECTING THE RECEIVER

1/8 in. (3.5 mm) TRS to Dual XLR Cable

Use this cable to connect the two-channel output of the receiver to a camcorder, portable recorder/mixer, or mixing board.

1/8 in. (3.5 mm) TRS to TRRS

Plug the TRS plug with the locking connector into the receiver's output, and connect the TRRS plug to the audio input of a smartphone, DSLR camera, or computer.

Headphones

To monitor the audio in real time, plug a headphone with a 3.5 mm connector into the headphone jack.

CONNECTING THE TRANSMITTER

Lavalier Microphone

Plug the included lavalier microphone into the mic input to broadcast the voice to the receiver.

Line Level Audio Source

Transmit the audio from a device like a smartphone, portable recorder, or computer to the receiver by connecting the output of the device to the 1/8 in. (3.5 mm) line in plug.

OPERATING THE RECEIVER

Powering On

Press and hold the power button until the screen illuminates.

The battery indicator shows the remaining battery power.

Setting the Output Signal **DUAL MONO**

The receiver can output a mixed stereo signal or a dual mono signal.

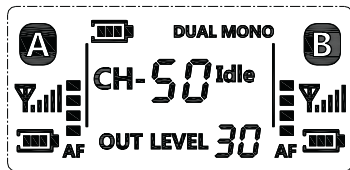
- Select the mixed stereo signal when there is only one XLR input available on your camera for your audio.
- The dual mono signal is good for recording dialog, so each signal is routed to its own channel.

To set the output signal:

1. Press the set button repeatedly until the audio output mode indicator blinks.
2. Use the left or right button to select mix or dual mono, and press the set button.

Setting the Receiver Channel **CH**

1. Press the set button repeatedly until the channel icon blinks.
2. Use the left/right buttons to select a channel.
3. Press the set button to set the selection.



Important: Both transmitters and the receiver must be set to the same channel. See *Setting the Transmitter Channel* below.

Finding an Interference-Free Channel **Idle**

The channel status indicator shows whether a channel is usable, or if it has excessive interference that will affect your audio.

Busy indicates the receiver has detected interference on the channel. Select another channel.

Idle indicates there is no interference on that channel.

Adjusting the Output Level **OUT LEVEL**

Refer to the documentation that came with your recorder, camera, or camcorder for its optimum input signal level. The receiver's default output level is 27.

To adjust the receiver's output level:

1. Press the set button repeatedly until the output level indicator blinks.
2. Use the left/right buttons to raise or lower the level.

Selecting a Transmitter Signal **B**

The receiver gives you the option of either recording both channels simultaneously, or just one channel if you're recording solo talent.

When the receiver is not connected to the transmitter, the transmitter signal indicator will blink. A steady transmitter indicator means the receiver is connected and receiving signal from the transmitter.

To select a transmitter signal:

1. Press the set button repeatedly until one or both transmitter indicators blink.
2. Use the left/right buttons to select transmitter A, B, or both.
3. Press the set button.

Important: Each transmitter signal must be set to the same channel as the receiver. See *Setting the Receiver Channel* above, and *Setting the Transmitter Channel* below.

Signal Strength

The RF reception indicator shows the strength of the transmitter's signal to the receiver.

Ideally, the reception should be at full strength. To remedy a weak signal, see *Setting Signal Strength* below.

Audio Level

Each transmitter signal has an audio meter. The level of the transmitter signal should be strong enough to record audio accurately and without distortion or dropouts.

The audio level should be as high as possible without peaking. If the meter rises to the top due to intermittent loud noises or vocal plosives like P and B sounds, it could distort the audio. To remedy peaking audio, see *Setting Mic/Line Level Input* and *Setting Input Volume (Gain)* below.

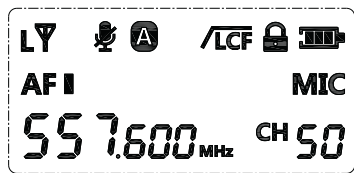
OPERATING THE TRANSMITTER

Setting Signal Strength **LY**

The transmitter has a selectable high and low RF transmission power setting.

L (Low, 15 mW) is ideal when the transmitter is close to the receiver. It also provides the transmitter with approximately 20% more run time.

H (High, 25 mW) transmits a stronger signal, and allows the microphone to cover a wider area and more range. This setting is recommended if your subject is moving around or is consistently more than 200 feet from the receiver. This setting is also recommended if you're recording in an area with heavy RF interference.



To set the signal strength, follow these steps:

1. Press the set button repeatedly until the RF transmission power indicator blinks.
2. Use the left/right buttons to select H (high) or L (low).
3. Press the set button to accept.

Setting the Transmitter Channel

The transmission channel determines whether the transmitter sends the signal to the receiver on channel A or B.

To set the transmitter channel:

1. Press the set button repeatedly until the transmitter channel selector blinks.
2. Use the left/right buttons to select transmitter channel A or B.
3. Press the set button or wait for 10 seconds to implement the change.

Once the transmitter channel is selected, the transmitter channel status indicator will appear steadily on the receiver to indicate that signal is being received. If the receiver's transmitter channel indicator blinks, no signal is being received on that channel.

Setting Mic/Line Level Input **MIC**

Select mic to use the included lavalier microphone.

Select line to transmit the signal from a smartphone, computer, portable recorder, or field mixer.

To set the input level:

1. Press the set button repeatedly until the mic/line indicator blinks.
2. Use the left/right buttons to select mic or line.
3. Press the set button or wait for 10 seconds to implement the change.

Setting a Frequency Channel **CH**

Setting the channel selects the frequency used to transmit the signal to the receiver. There are 50 frequencies to choose from on each A and B transmitter channels.

Select an interference-free channel on the receiver first. Then set the transmitter to the same channel.

1. Press the set button repeatedly until the channel indicator blinks.
2. Use the left/right buttons to select a channel that matches the receiver's channel.
3. Press the set button or wait for 10 seconds to accept the change.

Setting Input Volume (Gain)

The transmitter's input volume level, or gain, determines the signal level that's sent to the receiver.

For optimum recording levels, see *Audio Level* above.

To set the input volume:

1. Press the set button repeatedly until the volume level indicator blinks.
2. Use the left/right buttons to adjust the volume from 0 to 7.

Important! Setting the volume to 0 means no sound is transmitted to the receiver.

3. Press the set button or wait for 10 seconds to accept.

Low-Cut Filter

Activate the low-cut filter to minimize low-frequency noise like rumble, room noise, or noise from fans, air conditioners, and overhead fluorescent lights.

To activate the low-cut filter, press and hold the set button until the LCF icon appears on the screen.

To turn off the low-cut filter, press and hold the set button until the LCF icon turns off.

Muting the Transmitter

The mute button mutes the input signal to the transmitter.

Press the mute button to mute the microphone while another person is speaking, or to prevent the microphone from picking up a separate audio source like programmed music or a video presentation.

Locking the Transmitter

Activating the transmitter lock prevents accidental changes to the transmitter's settings while a recording is in progress.

Press the left and right buttons simultaneously, and the lock icon appears on the screen.

Press the left and right buttons simultaneously again to unlock the transmitter.

STAGE DIRECTION AND TALENT CUEING

The UWM-2 can be used as an impromptu one-way voice communication system for stage directions and talent cueing. In this case, your talent will operate the receiver instead of the transmitter, and monitor via an earphone (not included) plugged into the headphone output. The offstage instructor can relay directions into the microphone via the transmitter from a remote location, or send cues from a broadcast mixer or IFB system via the line input on the transmitter.

SPECIFICATIONS

SYSTEM	
WIRELESS TRANSMISSION	Analog UHF
OPERATING RANGE	150 ft. (39.6 m) 300 ft. (91.4 m) in optimum conditions
FREQUENCY RANGE	538.000 to 586.000 MHz
INCLUDED TRANSMITTERS	2 × bodypack with lavalier microphone
NUMBER OF RF CHANNELS	100 (50 per transmitter channel)
DIVERSITY	No
RF FREQUENCY BAND	A: 538.000 to 557.600 MHz B: 556.400 to 586.000 MHz
RF BANDWIDTH	48 MHz
FREQUENCY STEP SIZE	400 KHz
TOTAL HARMONIC DISTORTION	<0.8%
MAX OPERATING RANGE	>100 ft. (30.5 m); 300 ft. (91.4 m) in optimum conditions
MODULATION	Wide band FM

TRANSMITTER

FORM FACTOR	Body pack
RF POWER OUTPUT	15 mW, 25 mW
AUDIO I/O	1/8 in. (3.5 mm) female line in (lockable) 1/8 in. (3.5 mm) female mic in (lockable)
THD	0.5% or less (-60 dBV, 1 kHz input)
SIGNAL-TO-NOISE RATIO	≥70 dB
MUTING	Yes, mute switch
AUDIO INPUT LEVEL	-60 dBV
GAIN RANGE	22 dB
FREQUENCY RESPONSE	20 Hz to 18 kHz
SYNC METHOD	Manual
ANTENNA	1 flexible, fixed
RF OUTPUT POWER	Low: 15 mW High: 25 mW
POWER REQUIREMENTS	AA battery (×2)

TRANSMITTER (CONT.)

APPROXIMATE BATTERY LIFE	8 hours (alkaline)
DISPLAY & INDICATORS	Backlit LCD (transmitter signal strength, transmission channel, mic/line, channel, volume, low-cut filter, mute)
OPERATING TEMPERATURE	32°F to 122°F (0°C to 50°C)
DIMENSIONS (H x W x D)	3.5 x 2.4 x 0.9 in. (8.9 x 6.2 x 2.2 cm)
WEIGHT	2.8 oz. (80 g)

RECEIVER

FORM FACTOR	Camera mount
MOUNTING OPTIONS	Mounting foot, 1/4-20 threaded socket, belt clip
ANTENNA	2 flexible, fixed
NUMBER OF AUDIO CHANNELS	2 (mixed, dual mono)
AUDIO I/O	1/8 in. (3.5 mm) female lockable 1/8 in. (3.5 mm) headphone out
DYNAMIC RANGE	40 Hz to 18 kHz (± 3 dB)
SIGNAL-TO-NOISE RATIO	<70 dB
POWER REQUIREMENTS	AA battery ($\times 2$)
OPERATING TIME	Approximately 8 hours (alkaline)
DISPLAY & INDICATORS	Backlit LCD (transmission channel, dual mono/stereo, channel, output level, RF signal, audio level meter, battery status)
HOUSING	ABS Plastic
OPERATING TEMPERATURE	32°F to 122°F (0°C to 50°C)
DIMENSIONS (H \times W \times D)	3.5 \times 2.4 \times 0.9 in. (8.9 \times 6.2 \times 2.2 cm)
WEIGHT	2.6 oz. (75 g)

MICROPHONE

TRANSDUCER	Back electret condenser
POLAR PATTERN	Omnidirectional
FREQUENCY RESPONSE	50 Hz to 20 kHz
SENSITIVITY	-37 dB \pm
IMPEDANCE	2.2 k Ω
MAXIMUM SPL	100 dB
TOTAL HARMONIC DISTORTION	<5%
OPERATING VOLTAGE	1 to 5 V
HEAD DIAMETER	0.25 in. (0.6cm)

FREQUENCY ALLOCATION CHART

	TRANSMITTER A	TRANSMITTER B
CHANNEL	FREQUENCY	FREQUENCY
1	538.000	566.400
2	538.400	566.800
3	538.800	567.200
4	539.200	567.600
5	539.600	568.000
6	540.000	568.400
7	540.400	568.800
8	540.800	569.200
9	541.200	569.600
10	541.600	570.000
11	542.000	570.400
12	542.400	570.800
13	542.800	571.200
14	543.200	571.600

	TRANSMITTER A	TRANSMITTER B
CHANNEL	FREQUENCY	FREQUENCY
15	543.600	572.000
16	544.000	572.400
17	544.400	572.800
18	544.800	573.200
19	545.200	573.600
20	545.600	574.000
21	546.000	574.400
22	546.400	574.800
23	546.800	575.200
24	547.200	575.600
25	547.600	576.000
26	548.000	576.400
27	548.400	576.800
28	548.800	577.200

	TRANSMITTER A (CONT.)	TRANSMITTER B (CONT.)
CHANNEL	FREQUENCY	FREQUENCY
29	549.200	577.600
30	549.600	578.000
31	550.000	578.400
32	550.400	578.800
33	550.800	579.200
34	551.200	579.600
35	551.600	580.000
36	552.000	580.400
37	552.400	580.800
38	552.800	581.200
39	553.200	581.600
40	553.600	582.000
41	554.000	582.400
42	554.400	582.800

	TRANSMITTER A (CONT.)	TRANSMITTER B (CONT.)
CHANNEL	FREQUENCY	FREQUENCY
43	554.800	583.200
44	555.200	583.600
45	555.600	584.000
46	556.000	584.400
47	556.400	584.800
48	556.800	585.200
49	557.200	585.600
50	557.600	586.000

TROUBLESHOOTING

Problem	Solution
<p>The audio is noisy or distorted. This can include dropouts, white noise, bursts, pops, and clicks.</p>	<ul style="list-style-type: none">• Noise might be caused by RF interference. Try a different channel. Make sure both units are on the same channel.• There can be a lot of RF interference outdoors. Try moving indoors, where there is less RF interference.• Keep the units' antennas at least 2 feet (0.6 m) away from conductive objects like metal and water. Overhead telephone lines, fluorescent lighting, and metal fences can all cause interference.• Turn off all nearby computers and mobile phones.• Test your RF environment before recording. To do this, turn on the receiver. If there is noise from interference on the channel, the channel indicator will show BUSY, and you should avoid using it.• Noise can also be caused by receiver overload. If the antennas are too close, it can cause receiver overload (intermodulation). Make sure the antennas are at least 3 feet (0.9 m) away from each other.• You may be experiencing a weak signal. Make sure there is an unobstructed line of sight between the receiver's and the transmitter's antennas. Keep in mind that your body, wardrobe, and onstage sets are possible obstructions. Make sure the receiver and transmitter are within the 300-foot (100 m) range. If there are obstructions, you may need to move closer.
<p>The receiver is getting sound from only one channel.</p>	<ul style="list-style-type: none">• Set both transmitters and the receiver to the same channel.• Set the transmitter volume to a higher output level.• Make sure the transmitter is within range of the receivers.• Make sure one transmitter is set to transmitter channel A, and the other is set to transmitter channel B.

Problem	Solution
The input level on the camera, recorder, or mixer is too high.	<ul style="list-style-type: none"> • Turn down the audio input level on your camera or recording device. • Decrease the receiver's output level. • Make sure the output of the receiver is plugged into the line-level input on your mixer, or that the line/mic switch on your mixer is set to line. • Turn down the gain on your mixer. • Adjust the output volume on the transmitter, but keep this level as high as possible without distortion.
There is no audio.	<ul style="list-style-type: none"> • Make sure the transmitter's mute button is not active. • Check all cables to make sure they are completely plugged into the proper inputs. • If you are transmitting a line-level signal, make sure there is audio coming out of the line-source device. • If you want to record via the microphone input, make sure there is nothing plugged into the transmitter's line-level input. • If there is no sound in the headphones, make sure the headphones are completely plugged into the headphone jack. Increase the receiver's output level. • Make sure the transmitter and receiver are set to the same channel. • Make sure the receiver is receiving signal from the transmitters, and the transmitter indicators are not blinking.

Problem	Solution
Too much ambience is being picked up.	<ul style="list-style-type: none">• If you're using an omnidirectional microphone, the microphone may be picking up too much ambience or room noise.• Make sure the microphone is as close as possible to the subject. Approximately 6 inches (15.2 cm) from the subject is usually good microphone placement, but you may need to experiment.• Reduce acoustic reflections in the area by hanging an acoustic blanket, acoustic foam, fabric, or rug over bare walls, floors, and windows.
Too much low-frequency noise and rumble are being picked up.	<ul style="list-style-type: none">• Activate the low-cut filter on the transmitter.• Make sure the foam windscreen is on the lavalier microphone to minimize wind noise.• Turn off nearby fans or air conditioning units.

ONE-YEAR LIMITED WARRANTY

This Polsen product is warranted to the original purchaser to be free from defects in materials and workmanship under normal consumer use for a period of one (1) year from the original purchase date or thirty (30) days after replacement, whichever occurs later. The warranty provider's responsibility with respect to this limited warranty shall be limited solely to repair or replacement, at the provider's discretion, of any product that fails during normal use of this product in its intended manner and in its intended environment. Inoperability of the product or part(s) shall be determined by the warranty provider. If the product has been discontinued, the warranty provider reserves the right to replace it with a model of equivalent quality and function.

This warranty does not cover damage or defect caused by misuse, neglect, accident, alteration, abuse, improper installation or maintenance. EXCEPT AS PROVIDED HEREIN, THE WARRANTY PROVIDER MAKES NEITHER ANY EXPRESS WARRANTIES NOR ANY IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This warranty provides you with specific legal rights, and you may also have additional rights that vary from state to state.

To obtain warranty coverage, contact the Polsen Customer Service Department to obtain a return merchandise authorization ("RMA") number, and return the defective product to Polsen along with the RMA number and proof of purchase. Shipment of the defective product is at the purchaser's own risk and expense.

For more information or to arrange service, visit www.polsenaudio.com or call Customer Service at 212-594-2353.

Product warranty provided by the Gradus Group.
www.gradusgroup.com

