INSTRUCTION MANUAL

QUADRA™

Digital IEM System

Fill in for your records:

Serial Number:

Purchase Date:

LECTROSONICS®
Rio Rancho, NM, USA
www.lectrosonics.com

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FCC Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications to this equipment not expressly approved by Lectrosonics, Inc. could void the user's authority to operate it.

Industry Canada Notices

Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept interference, including interference that may cause undesired operation of the device.

This device has been designed to operate with the antenna listed below, and having a maximum gain of 6 dB. Antennas not included in this list or having a gain greater than 6 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

- Lectrosonics M4T Antenna; P/N 21422
- Linx Technologies model ANT-916-CW-HWR-RPS

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Safety Notes

Excessive sound levels can cause permanent hearing damage.

1. Always adjust the volume to the lowest level before listening to unknown transmissions.
2. Use the lowest reasonable level consistent with hearing safety.
3. Don't use high sound levels in the earphone to overcome high ambient sound levels. That is absolutely foolish! Demand and use high isolation earphones.
4. Don't expose your ears to sound levels that cause them to ring. If your ears do ring after exposure, think of it as a ***warning bell*** telling you not to do that again.

OSHA (Occupational Safety Health Administration) guidelines on the maximum allowable time exposure to sound pressure levels that will cause hearing damage are as follows:

8 hours	at	90	dB	SPL
4 hours	at	95	dB	SPL
2 hours	at	100	db	SPL
1 hour	at	105	dB	SPL
30 mins	at	110	dB	SPL
15 mins	at	115	dB	SPL

NEVER expose your ears to 120 dB SPL or higher! Damage will occur.

System Overview

The Quadra system provides an entirely new level of audio and RF performance in a wireless monitor system. The combination of analog or digital input capability, ultra-low latency 24 bit, 48 kHz audio, digital RF modulation and discrete four channel mixing capability make the Quadra a truly unique IEM product for mission-critical, professional applications.

The system is designed for line level analog audio signals and AES/EBU digital audio input signals. 48kHz/24-bit audio, ruler-flat 20Hz to 20kHz frequency response, ultra-low distortion and high dynamic range assure excellent audio quality. Housings and panels are machined aluminum with electrostatic powder coated and anodized finishes and laser etched marking for durability. An intuitive mixing interface and comprehensive LCD on the belt pack receiver provide performing artists and monitor engineers alike with a comfortable and confident user experience.

M4 Transmitter

The half-rack transmitter can accept up to four inputs from digital or analog sources. The inputs can be configured as follows:

- Four analog inputs using all four jacks
- Two digital inputs using jack 1 and two balanced analog inputs using jacks 3 and 4
- Four digital channels using jacks 1 and 2

The input connectors are full-size balanced XLR types for AES/EBU and balanced line level analog signals. Input preamp circuits use a special balanced amplifier with very high common mode rejection to minimize hum and noise.

Either analog or AES/EBU digital input signals are converted to an internal 24-bit digital format which is then encoded, organized into packets, and passed to an RF modulator using spread spectrum techniques and error correction for robust reception. The modulated RF signal is filtered before and after amplification to suppress out-of-band noise and spurious signals, and a circulator/isolator guards against intermodulation interference (IM).

The transmitter can be free-standing or rack-mounted in single units (via an optional rack mounting kit) or in a dual configuration using supplied hardware.

A USB port is provided for firmware updates.

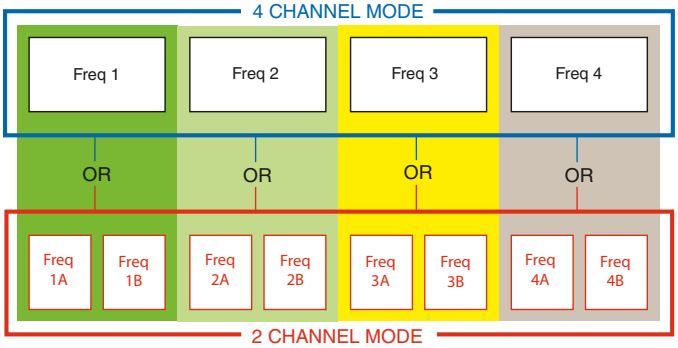
M4 Receiver

The receiver employs advanced antenna switching diversity reception, switching between the antennas during packet headers in order to maintain a seamless audio signal. A configurable four-channel mixer on the top of the receiver housing allows the user to mix four discrete audio channels according to the needs of the performance. The headphone jack is fed from a high-quality stereo amplifier with 100 mW available to drive headphones or earbuds to sufficient levels for stage performance or other environments with significant background noise. A high-density, backlit LCD allows the user to make setup changes via the available menu options.

A USB port is provided for firmware updates.

Frequency Range

Using the license free 902 - 928 MHz ISM band, this system is outside the normal broadcast frequencies thus providing both technical and operational advantages over standard analog systems.



In four-channel mode, the system occupies 4 MHz and is selectable between four available center frequencies: 907.776, 912.384, 916.992 and 923.904 MHz. In two-channel mode, Quadra occupies 2 MHz and is selectable between eight available center frequencies: 906.624, 908.928, 911.232, 913.536, 915.840, 918.144, 922.752 or 925.056 MHz.

Multi-Channel Capability

Quadra can be configured to provide either 2 or 4 audio channels. In the 2-channel mode, eight different frequencies are available, each with two audio channels. In the 4-channel mode, four different frequencies are available, each with four audio channels. Multiple Quadra systems can be operated in the same location to provide up to 16 total audio channels between all units.

The performer can then use the on-board mixer to tailor the audio output to his or her tastes or the requirements of the performance at hand.

Receiver Operation

Battery Insertion

The receiver is powered by three AA batteries, either alkaline, lithium, or rechargeable types. Do not use “heavy duty” batteries from a drug store - they will not last long in the M4 receiver.

Open the battery door by pressing on it while sliding it downward. It should then flip open allowing full access to the battery compartment. Carefully note the battery orientation as indicated by the diagrams inside. The outer two batteries are positive (+) facing in, while the middle battery is positive (+) facing out.

Once the three batteries are in place, close the door by swinging it shut then sliding it upwards while applying slight pressure. It should snap shut and line up with the case.

Powering the Unit ON and OFF

Press the power button once to turn on the unit. Check to see that the LCD displays the single screen Power Up Sequence showing the company logo, model number and firmware revision.

Power Button

After the Power Up Sequence is displayed briefly, the Main Window appears and the M4R is ready for operation.

Note also that the ***BATT*** LED should be lit. Green indicates good power. Red indicates your batteries are 2/3 depleted. Flashing red indicates that you should replace your batteries as soon as possible.

To turn the receiver off, press and hold the power button for three seconds. A countdown will be displayed until the power is turned off.

Control Panel/Knobs

The four knobs on the top edge of the M4 receiver (two are in a dual concentric arrangement and two are separate) allow for a number of mixer configurations by using the ***Chan. Setup*** in the LCD menu. The first knob (the tall, skinny one) is usually set as a Master Volume, while the other three can be set up differently depending on the artist’s needs and preferences. See ***Selecting 2 Channel or 4 Channel Operation*** below for details.

The headphone jack is a standard 1/8” stereo TRS (tip, ring, sleeve) jack with standard headphone wiring (tip is left, ring is right, sleeve is ground). The headphone amp can deliver 100mW into a 32 Ohm load so it is important to always start with the volume low before plugging in your headphones or earbuds.

CAUTION: Hearing damage can result from listening too loudly with this receiver!

LCD

The boot sequence will briefly display the company logo, model number and firmware revision.

Following the boot-up sequence, the receiver will revert to the Main Window, showing the following:

- Operating frequency at the upper left (Frq1, Frq2, etc. in 4 Channel or Split modes, and Frq1a, Frq1b, Frq2a, etc. for 2 Channel operation)
- RF level meter (along the top edge of the LCD)
- Audio level meters in the middle of the display (either two or four, depending on operating mode)
- Along the bottom, how the meters relate to the knobs, depending on operating mode

Receiver Menus

To access the setup menus, press the ***MENU/SEL*** button at the upper left of the membrane panel. Press the ***BACK*** button to back up one level or return to the main window. The UP and DOWN arrow buttons along the right side of the control panel allow you to navigate between menu options and to adjust specific parameters within the setup screens.

Battery status is indicated by a ***GREEN*** LED. The LED turns ***RED*** to indicate that your batteries are 2/3 depleted. ***FLASHING RED*** indicates that you should replace your batteries as soon as possible.

The blue “RF” LED indicates an RF lock between the transmitter and receiver, when lit.

Selecting 2 Channel or 4 Channel Operation

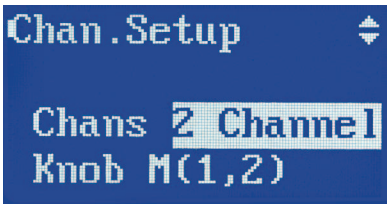
The ***Chan. Setup*** screen allows you to select whether the receiver operates in 2 ch., 4-ch. or split 4-ch. modes, and then how the knobs on the top of the receiver are configured as a mixer.

Each ***Chan. Setup*** screen allows selection of 2 Channel and 4 Channel modes, plus a second line for selection of the knob configurations.

Press ***MENU/SEL*** to toggle the highlight between the ***Chans*** and ***Knob*** lines and use the ***UP*** and ***DOWN*** arrow keys to make selections.

2 Channel Operation

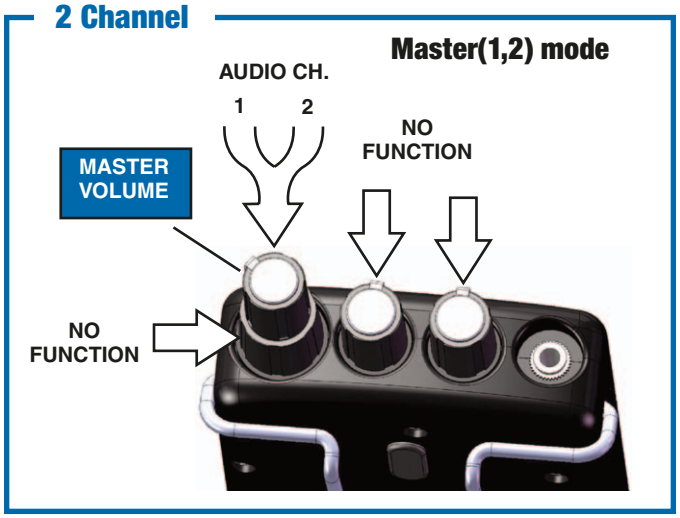
In this mode, two channels are fed to the transmitter and are available at the receiver.

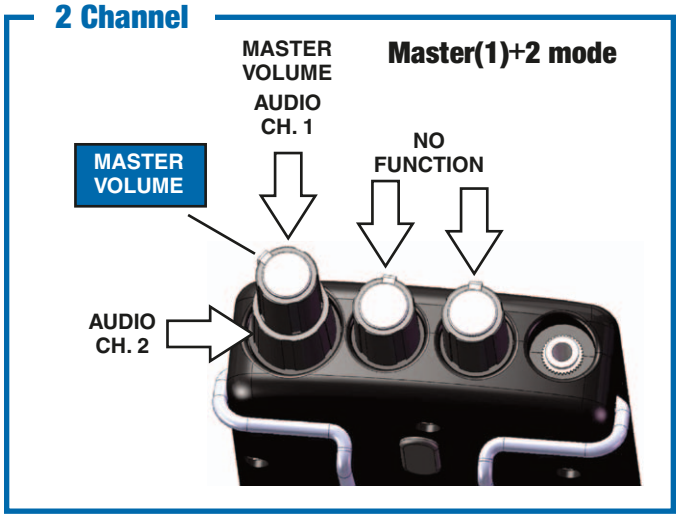


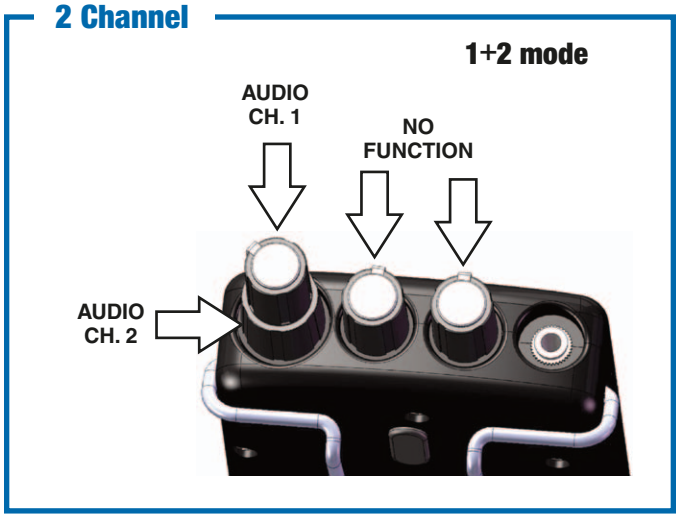
NOTE: the transmitter must be also in 2 Channel mode for the receiver to operate in this manner.

2-ch. mode allows for three different knob setups:

- **Master(1,2)**
  This is the ***factory default*** and is equivalent to standard IEM systems where only a stereo signal is used. The tall, thin knob is the stereo master volume.
- **Master(1)+2**
  Feeds audio channel 1 to the master volume (tall, thin knob) and audio channel 2 to the lower concentric knob for independent control. You can develop a stereo mix by panning each channel in the stereo field (see panning, below).
- **1+2**
  Gives you individual control over both audio channels. Audio channel 1 is fed to the tall thin knob, and audio channel two is fed to the lower concentric knob. In this setup, **there is no master volume knob**. You can develop a stereo mix by panning each channel in the stereo field (see panning, p. 10).

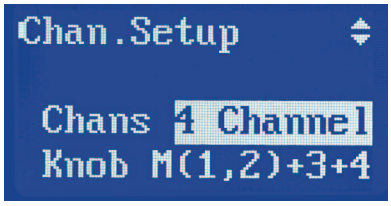






4 Channel Operation

In this mode, all four audio channels fed to the transmitter are available at the receiver.



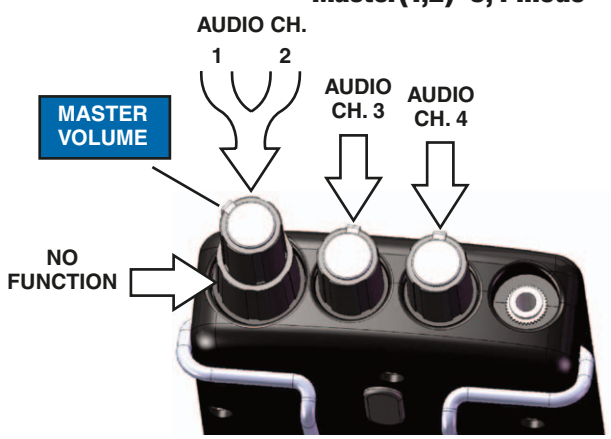
NOTE: the transmitter must be in 4 Channel mode for the receiver to work in this manner.

Audio can be routed to the four audio control knobs in the following ways:

- **Master(1,2)+3,4**
  Feeds channels 1 & 2 to the master volume knob in a fixed stereo relationship, while audio channels 3 & 4 are on the two smaller separate knobs. This gives you individual control over two of the channels in their relationship to the stereo mix. For instance, you may want to have drums and bass (in stereo) on 1 & 2, your guitar in ch. 3 (first small knob, in the middle) and your vocals in ch. 4 (second small knob, closest to the headphone jack). After choosing this mode, you would use the master knob to control your overall volume, and the other two knobs to change how those two individual channels are mixed into the master.
- **Master(1)+2, 3, 4**
  Places ch. 1 on the master knob, and then gives you individual control over channels 2, 3 and 4. Use this mode if you plan to have a mono mix as a starting point, and then add three additional channels that you would like to adjust during performance. An example would be drums and bass (in mono) on 1, backing vocals on 2, your guitar on 3, and your vocals on 4. Each of the channels can still be panned in the stereo field.
- **1+2+3+4**
  Gives you individual control over all four audio channels. In this setup, **there is no master volume knob**. You can develop a stereo mix by panning each channel in the stereo field (see panning, below).

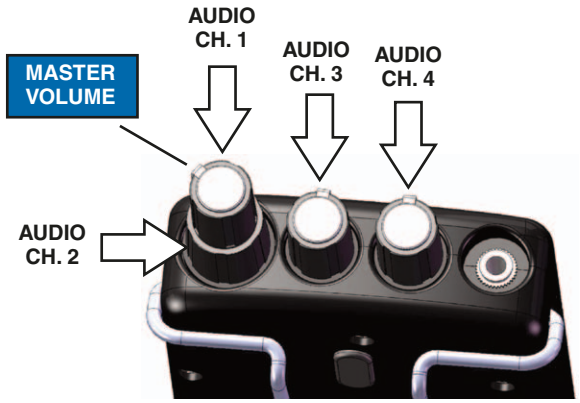
4 Channel

Master(1,2)+3,4 mode



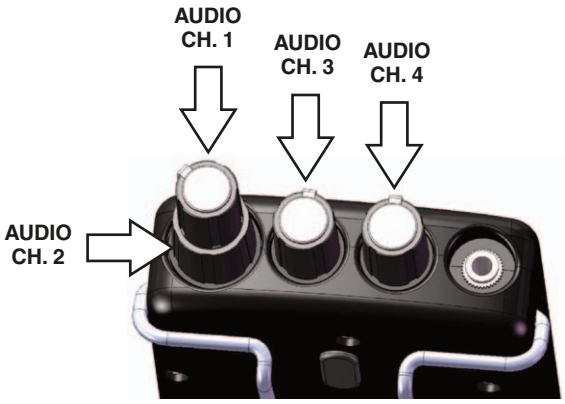
4 Channel

Master(1)+2,3,4 mode



4 Channel

1+2+3+4 mode



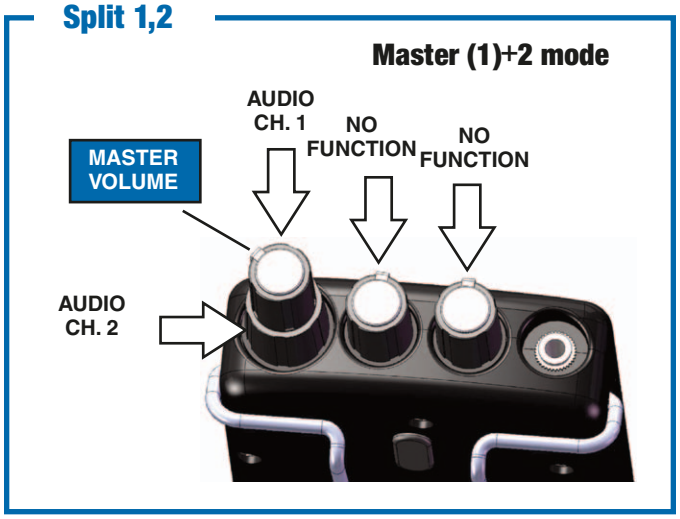
Split 1,2 Operation

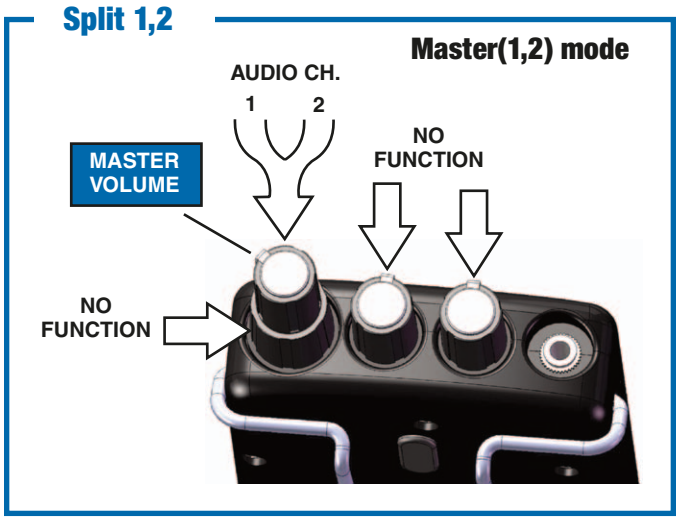
Split modes allow you to use a single M4T transmitter running in the 4 Channel mode to send two different 2 channel stereo mixes to two different receivers or groups of receivers using a single radio frequency.

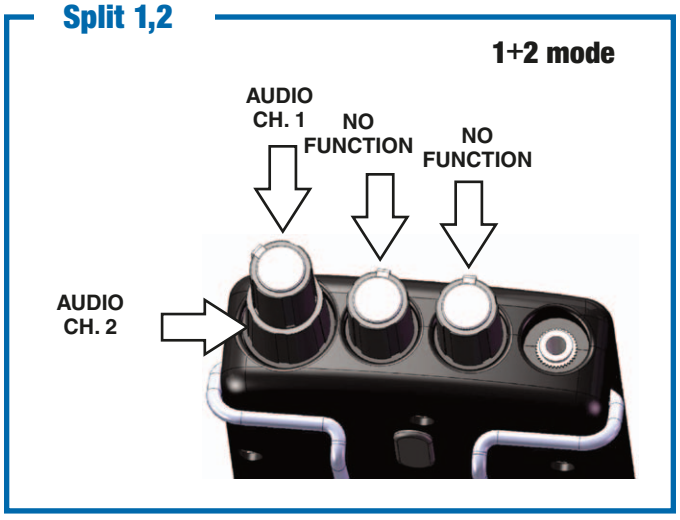
Split 1+2 mode delivers audio channels 1 and 2 to the tall, thin knob and the lower concentric knob. The knobs can be set up to function in three different ways.

NOTE: the transmitter must be in 4 Channel mode for the receiver to work in this manner.

- **Master(1)+2**
  Feeds audio channel 1 to the master volume (tall, thin knob) and audio channel 2 to the lower concentric knob for independent control.
- **Master(1,2)**
  Equivalent to standard IEM systems where only stereo signal is used. The tall, thin knob is the stereo master volume and is fed from audio channels 1 & 2. Here, although there is audio on channels 3 & 4 in the transmission itself, they are muted and thus the two individual knobs do not function.
- **1+2**
  The two knobs function independently with neither one working as a master. Feeds audio channel 1 to the tall, thin knob and audio channel 2 to the lower concentric knob for independent control.







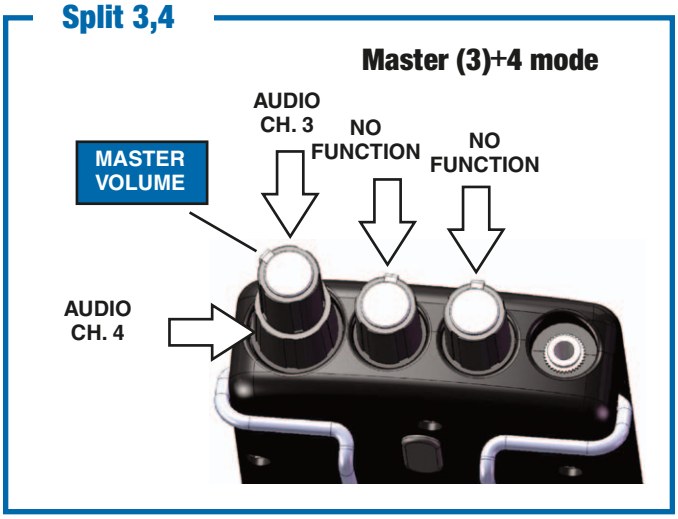
Split 3,4 Operation

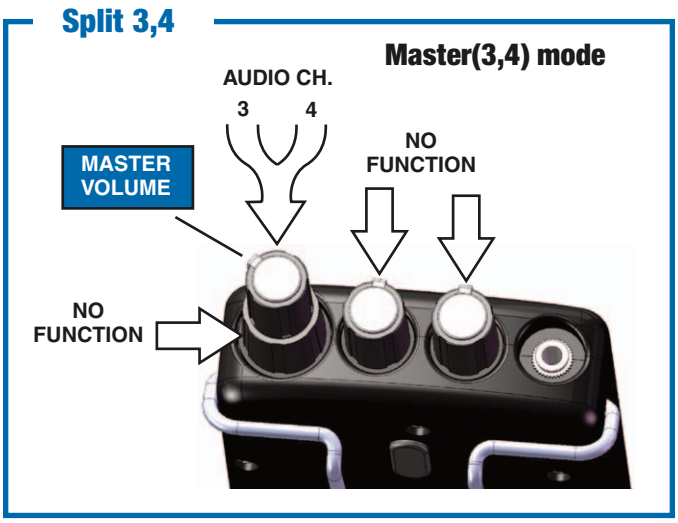
Split modes allow you to use a single M4T transmitter running in the 4 Channel mode to send two different 2 channel stereo mixes to two different receivers or groups of receivers using a single radio frequency.

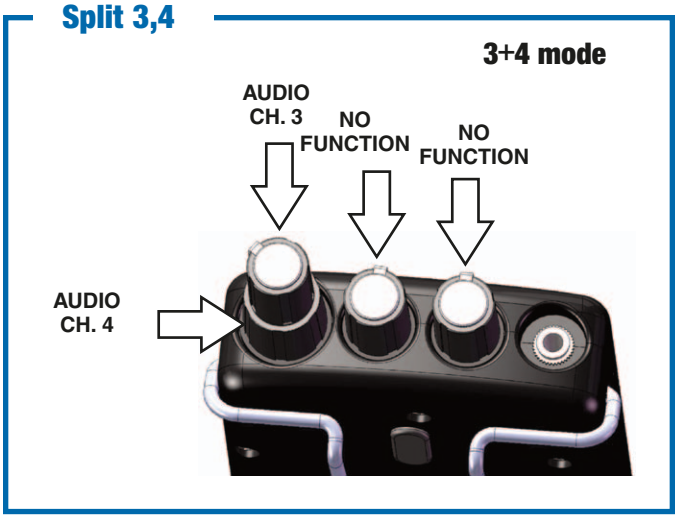
Split 3+4 mode delivers audio channels 3 and 4 to the tall, thin knob and the lower concentric knob. The knobs can be set up to function in three different ways.

NOTE: the transmitter must be in 4 Channel mode for the receiver to work in this manner.

- **Master(3)+4**
  Feeds audio channel 3 to the master volume (tall, thin knob) and audio channel 4 to the lower concentric knob for independent control.
- **Master(3,4)**
  Also equivalent to standard IEM systems where only stereo signal is used. The tall, thin knob is the stereo master volume and is fed from audio channels 3 & 4. Here, although there is audio on channels 1 & 2 in the transmission itself, they are muted and thus the two individual knobs do not function.
- **3+4**
  The two knobs function independently with neither one working as a master. Feeds audio channel 3 to the tall, thin knob and audio channel 4 to the lower concentric knob for independent control.







Additional LCD Screens

Tune

To select your RF operating frequency, choose ***Tune*** in the menu list, and press the ***MENU/SEL*** button.

Here, you can choose between four operating frequencies in the 4 Channel mode or one of the Split modes, or eight operating frequencies the in 2 Channel mode.

You should test your proposed frequency by first ensuring that your transmitter is turned off and then observing the RF level in the LCD on your receiver in the main window.

RF signal strength is indicated by this status bar.

If you see a large RF signal at the receiver and your transmitter is off, you may want to choose a different operating frequency to attain as much operating range as possible.

Note: Frequency 1a at 906.624 MHz is the factory default setting.

Once you have selected an operating frequency, press the ***BACK*** button to return to the main menu list. As soon as you turn on your transmitter (see transmitter section), place it in the correct mode (2 ch. vs. 4 ch.) and then tune it to the same frequency as your receiver/s, you should see the blue ***RF LED*** light on your receiver/s. This indicates you have a signal lock between the transmitter and receiver.

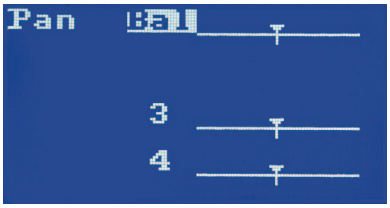
Pan

To select your overall stereo balance and stereo panning for individual audio channels, use the arrow buttons to highlight ***Pan*** in the menu list.

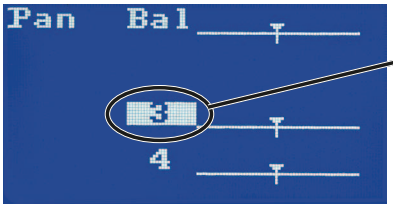
Press the ***MENU/SEL*** button to enter the setup screen. The setup screen that appears will be determined by the 2 channel or 4 channel mode and the knob configuration you have selected. Continue pressing ***MENU/SEL*** to select the channel, then use the ***UP*** and ***DOWN*** arrows buttons to adjust the balance.

Note: All channels panned center and stereo balance centered is the factory default setting.

In a mode that defines a Master knob, the uppermost channel line is labled ***BAL***.

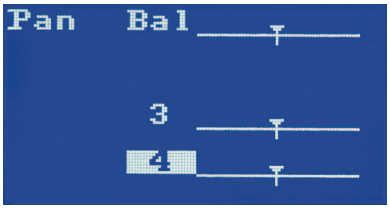


Use the ***MENU/SEL*** button to move between master balance and the available audio channels.



Press MENU/SEL to select channel (highlight)

For stereo balance (when available), use either the arrow keys or the lower concentric knob to adjust the desired L-R balance.



Use UP and DOWN buttons or lower concentric knob to pan the highlighted channel

For individual channels (when available), use either the arrow keys or the lower concentric knob to pan the channel to the desired position in the stereo field.

Once you have completed the necessary adjustments, press the “BACK” button to exit this screen and return to the main menu.

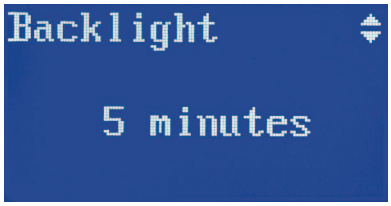
Limiter

This feature can be used in order to provide audio limiting at the receiver in order to prevent excessive levels at the headphones or earbuds. To set the amount of limiting, highlight “Limiter” in the menu list using the arrow keys. Press ***MENU/SEL*** to choose this function.

Use the arrow keys to select the limiter threshold in 3 dB increments. Test it with a known signal to determine the maximum sound level you are comfortable with. The pre-gain setting can then be used to boost the audio level ahead of the limiter. Use this feature if you need to make up for weaker audio input levels at the transmitter. Use the ***MENU/SEL*** button to choose “Pregain”, then use the arrow buttons to adjust in 3 dB increments.

Backlight

The backlight control page allows you to select the length of time before the backlight turns off on the receiver. The factory default setting is 5 minutes, but you can also select 30 seconds or ***Always on***.



Treble Shelf

In this screen, you can choose a treble boost with a corner either at 5kHz or 7kHz, and a boost of up to 9 dB in 3 dB increments. This feature can be used to compensate for a stereo mix that is lacking high frequency information, or earbuds that “roll off” too early in the high frequency area.

This high-frequency boost should be used sparingly due to the fact that it can accelerate hearing loss with high volumes in the earphones or headphones. Note: the factory default setting is 5 kHz corner with 0dB boost.

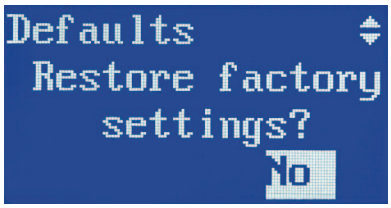
Lock Setup

This feature is used to lock the control panel so that no further changes can be made, other than normal adjustments to the upper mixing knobs. Once ***Locked*** is selected, note that a small lock icon appears in the upper right of each setup menu screen. With the receiver locked, you can view each menu screen but you are unable to make changes and the power can not be turned off.

To return to the unlocked status, go back to the ***Lock Setup*** screen via the main menu, and select ***Unlocked***. Also, note that the ***Locked*** status is maintained even if the batteries are changed.

Factory Default

This is used if you intend to reset the receiver to all the factory default settings.



Factory Default Settings:

- 2 Channel operation
- M (1,2) knob setup
- RF Frequency 1a (906.624 MHz)
- Limiter at 0 dB threshold
- Pre-Gain at +0 dB
- Backlight: off at 5 minutes
- Treble Shelf: 5 kHz corner, +0 dB
- Unlocked

Receiver: Body Placement

Position the receiver on a belt, guitar strap, wardrobe, etc. so that the antennas are oriented vertically and not touching a metallic surface. Make sure the antennas are on the outside of thick or metallic costuming so the antenna whips will be out in the open. It is also good practice to keep the antenna whips from contacting a person's body directly for maximum receive sensitivity.

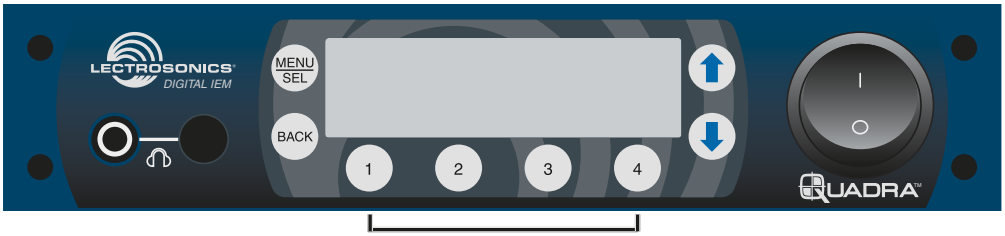
Receiver Accessories

P/N 25984 replacement wire belt clip.

CCM4R Foam lined carrying case.

BCHINGED Spring-loaded belt clip kit

Transmitter Front Panel

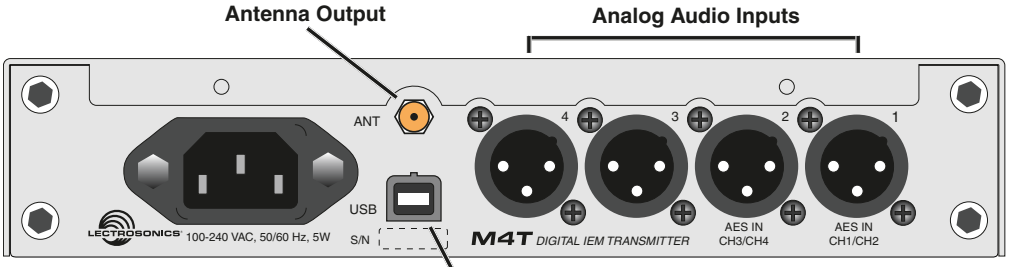


Headphone Monitor

Channel Select Buttons

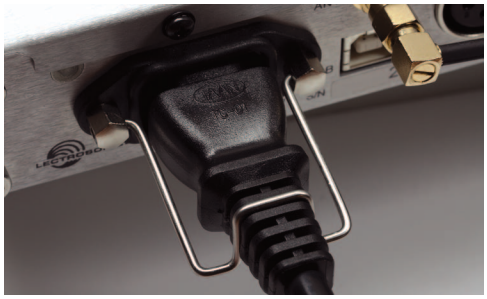
Power Switch

Transmitter Rear Panel



Initial Setup

Connect AC power to the M4T transmitter using the provided power cable. To ensure that the power cable can not come loose, use the provided wire retainer.



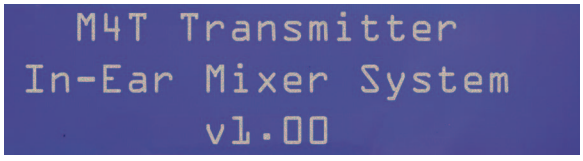
Attach the supplied antenna to the antenna port on the back of the M4T, and position it pointing upright while tightening the knurled nut at the base of the antenna. If you are rack-mounting one or more M4T transmitters, please see the section on installing rack mounting hardware on p. 18.

Connect your audio inputs via the XLR connectors. Note that, like a mixing console, the inputs are oriented right to left, jacks 1-4. If you are feeding the transmitter with analog audio signals, connect your channel 1 to jack 1, channel 2 to jack 2 and so on.

If you are sending digital AES/EBU signals to the M4T transmitter, note that AES/EBU lines carry two channels on a single XLR connection. Therefore, channels 1 & 2 would be connected to jack 1, and channels 3 & 4 are connected to jack 2. Note also that in order to select between analog and digital inputs, use the front panel menu as incicated on p. 16.

Powering the Unit ON and OFF

Once you have connected AC power, the antenna, and your audio lines, apply power to the M4T using the switch on the front panel. The LCD displays a brief logo and graphic, followed by the model number, description and firmware version:



After the Power Up Sequence, the Main Window appears and the M4T is ready for operation.

To turn the transmitter off, simply return the front panel power switch to the “off” position.

LCD

The Main Window shows the following:

- **Operating frequency**

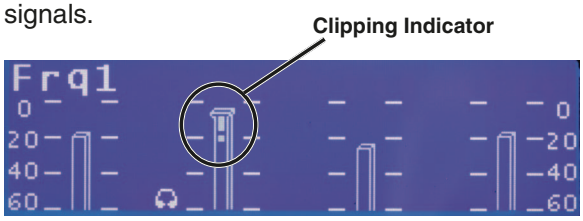
  Frq1, Frq2, etc. for 4-ch or Split 4-ch operation

  Frq1a, Frq1b, Frq2a, etc. for 2-ch operation - see Channel Setup on p. 16
- **Audio level meters** for either two or four channels (depending on how the M4T is set up - see Channel Setup on p. 16
- **Headphone monitoring channels** as indicated by the small headphone icons next to the level meters for those channels

Audio Signal Monitoring

The signals at the inputs can be monitored in two ways: using the LCD bar-graph meters for levels and with headphones listening to the actual signals. The LCD bar-graph meters show the audio level range from -60 to 0 dB. When the signal exceeds +20 dBu at an input, the bar graph indicates this with a bright “!” at the top of the bar on that channel. Because this is a digital system, overloads should be scrupulously avoided so as to prevent signal distortion at the converters.

NOTE: Do not “drive” this transmitter as you might be tempted to do with an analog IEM system. Generally, it is best to leave **at least 3 dB** of headroom above your strongest peaks to ensure that you are not clipping the signals.



To monitor the audio signal/s, plug into the headphone jack with headphones or earbuds. Push the volume knob so that it “pops out” for level adjustment. To select the channel/s for listening, press the numbered button/s 1-4 below those channels. Either one or two channels at a time can be monitored. When a single channel is chosen, it is panned center in the headphone stereo field. When two channels are chosen by pressing both buttons at the same time, they are panned hard left & right in the headphones.

CAUTION: Start with the monitor volume at a low setting before plugging in your headphones or earbuds - excessive volume can damage your hearing.

Transmitter Menus

To access the setup menus, press the ***MENU/SEL*** button at the upper left of the membrane panel. To back up one level or return to the "home screen," press the ***BACK*** button. The arrow keys along the right side of the control panel allow you to navigate between menu options and to adjust specific parameters within the menu windows.

When the desired menu item is highlighted, press the MENU/SEL button to enter the setup screen.

Selecting 2 Channel or 4 Channel Operation

The ***Chan. Setup*** screen allows you to select whether the transmitter operates in 2 Channel or 4 Channel mode. This determines the width of the RF carrier, and thus how many frequencies can be used in one place at one time. In 2 Channel mode, the RF carrier is 2 MHz wide, thus yielding 8 available operating frequencies. In 4 Channel mode, the RF carrier is 4 MHz wide, thus yielding 4 operating frequencies.

NOTE: for the system to operate, the transmitter and receiver must be in a compatible channel setup (2 ch. vs. 4 ch.) Furthermore, note that for the receiver to work in a Split Mode, the transmitter must be in the 4 Channel mode.

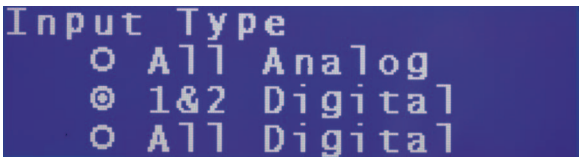
Tuning

Once you have selected a channel setup, you can choose an RF operating frequency. Generally, it is best to use your receiver to determine the best operating frequency with the tuning method described on p. 9. To then select the matching operating frequency on your M4T transmitter, use the up/down arrows to highlight ***Tuning*** on the menu list, then press ***MENU/SEL***. Here, you can select from four operating frequencies in the 4 Channel mode or eight operating frequencies in the 2 Channel mode.

Once you have selected a matching operating frequency, the ***blue LED*** on the front of your IEM receiver should light up, indicating an RF signal lock.

Input Type

This screen allows you to choose between analog and digital inputs, depending on your source from the mixing console. From the main menu, use the up/down arrow buttons to highlight ***Input Type***. Press the ***MENU/SEL*** to enter this page. Here, you have three choices: ***All Analog***, ***1&2 Digital***, and ***All Digital***. Because XLR inputs 1 and 2 also double as dual-channel AES/EBU digital inputs, only these three choices are possible.



NOTE: the M4T inputs are set to ***All Analog*** as a factory default. If you send digital signals to the input without changing the Input Type, the system will transmit a loud white-noise signal to the receiver. Also, if the receiver inputs are set to ***Digital***, and you are sending analog signals to the inputs, there will be no audio present.

Audio Trim

When using analog inputs, this feature gives you the opportunity to adjust the transmitter input gain in 1 dB increments, on a per-channel basis. For very "hot" analog signals from the console, you may need to attenuate the input gain to compensate, thus avoiding clipping and the resulting signal distortion.

To select audio input trim levels, use the ***UP/DOWN*** arrow buttons to highlight ***Audio Trim***, then use the ***MENU/SEL*** button to enter this page. Use the numbered buttons 1 through 4 to select the channel, then use the ***UP/DOWN*** arrows to increase or reduce the amount of attenuation on that channel.

NOTE: input channels that have been selected as AES/EBU digital inputs do not allow input level trim.

In the case where the resulting volume at the receiver headphones or earphones is deemed insufficient, the receiver provides makeup gain - see the receiver ***Pregain*** setting on p. 13 in the ***Limiter*** setup screen.

NOTE: Do not “drive” this transmitter as you might be tempted to do with an analog IEM system. Generally, it is best to leave at least 3 dB of headroom above your strongest peaks to ensure that you are not clipping the audio signals.

Lock Setup

The front panel buttons can be locked to prevent further changes. Use the ***UP/DOWN*** arrows to highlight ***Lock Setup*** and press the ***MENU/SEL*** button to enter that screen. Use the ***UP/DOWN*** arrows to select either ***Locked*** or ***Unlocked***. Once ***Locked*** is selected, no further changes can be made to the transmitter settings until this same screen is entered and ***Unlocked*** is selected. Note that the lock status is retained during a power cycle.

NOTE: Features not affected by ***Lock Setup*** include channel monitoring selection and headphone volume.

NOTE: The ***Lock*** status is retained even if the power to the transmitter is cycled.

Factory Default Reset

To restore factory default settings, use the ***UP/DOWN*** arrow buttons in the main menu to highlight ***Defaults***, then press the ***MENU/SEL*** button. Use the ***UP/DOWN*** arrows to select ***Yes***, then press the ***MENU/SEL*** button. The screen will show ***Defaults Restored*** thus indicating that the process is complete.

CAUTION: DO NOT restore factory defaults while someone is listening to the receiver with headphones or earbuds - the resulting change in levels or input type may cause a VERY LOUD signal to be transmitted to the receiver.

Factory Default Settings:

- 2 Channel Operation
- RF Frequency 1a (906.624 MHz)
- All Analog Inputs
- Audio Trim at -20 dB
- Unlocked

Rack Mount Hardware

The M4T is delivered with a partial set of rack mount hardware, including bolts, a rack ear, connecting flanges, antenna cable and front-panel handles. With two M4T units, there is enough hardware supplied to connect the two units together, front-mount the antennas, and prepare the units as a complete assembly ready for mounting in a rack enclosure.

If you need to rack-mount a single M4T transmitter, you will need to purchase the optional RMPM4T-1 rack kit. The kit provides a blank half-rack panel, a rear mounting brace and the additional hardware required for this setup.

Dual Unit Rack-Mount Instructions

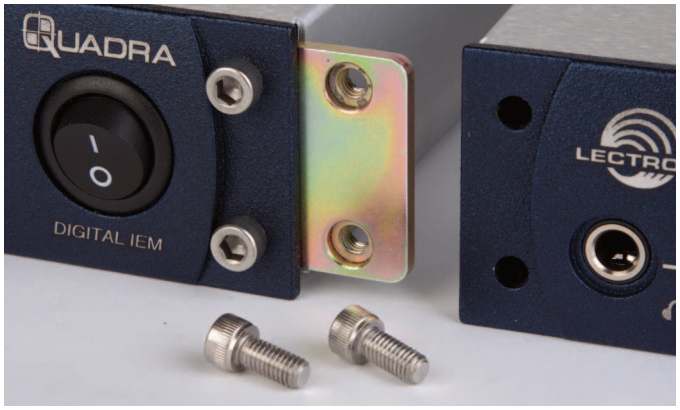
1. Remove the plastic end-caps from the front of the M4T and pry out the metal inserts on each side of the transmitters with a small screwdriver.

Plastic guards snap out from corners. Pry out the aluminum inserts on the side panel with a small screwdriver.

2. Attach the antenna cables to the rack ears with the supplied nuts and lock washers. Tighten with a small wrench - do not over-tighten the nuts but make sure they are snug enough not to work loose.

3. Insert the rack ears and attach the handle to the front of the panels using the supplied hex-head bolts and hex wrench. The screws should go through the handles, through the front panel, and into the rack ear nuts. Tighten these bolts loosely.

4. Remove the hex head bolts from the rear of both units right where they contact each other. Attach the two units using the two metal flanges, the non-threaded one for the rear and the threaded one for the front. Secure them with the supplied hex head bolts. Tighten these bolts firmly.



NOTE: The threads in the front adapter plate are a self-locking type. Tighten the screws until the head is flush with the front panel.

8. Attach the antenna wires to the antenna ports on the back of the transmitters.

9. Attach the supplied antenna connector protectors to the sides of the transmitters right behind the rack ears. Secure them with the supplied screws. Note that this item will fit tightly and is meant to deform slightly during installation.

The dual set of M4T transmitters is now ready for rack mounting.

Single Unit Rack-Mount Instructions

Assembling the optional RMPM4T-1 kit:

1. Remove the plastic end-caps from the front of the M4T transmitter. Pry out the metal inserts on each side of the transmitter with a small screwdriver

Plastic guards snap out from corners. Pry out the aluminum inserts on the side panel with a small screwdriver.

2. Attach the antenna cable to the rack ear with the supplied nut and lock washer. Tighten with a small wrench - do not over-tighten the nuts but make sure they are snug enough not to work loose. Insert the rack ear into the left side of the transmitter front panel.
3. Insert the rack ear and attach the handle to the front of the panel using the supplied hex-head bolts and hex wrench. The screws should go through the handle, through the front panel, and into the rack ear nuts. Tighten these bolts firmly.

4. Attach front bracket plate to right side of panel.

Insert the screws partially, but do not tighten them yet.

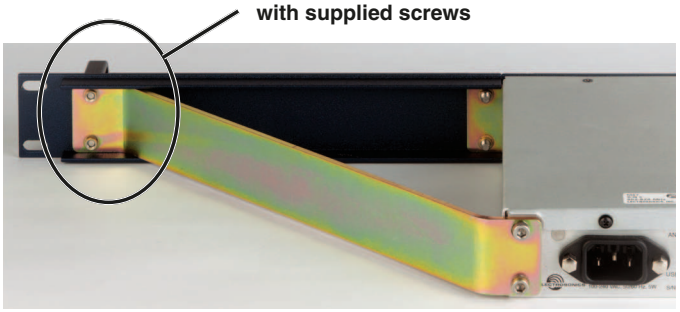
5. Attach the blank panel to the bracket and tighten all four screws.

The threads in the front adapter plate are a self-locking type. Tighten the screws until the heads are flush with the front panel.

6. Mount the steel brace with the supplied screws. Do not tighten the screws yet.

7. Attach the steel brace to the blank panel using the supplied screws. Tighten all four screws that retain the brace.

Install handle and bracket with supplied screws



8. Attach the supplied antenna and antenna connector guard. Note that this item will fit tightly and is meant to deform slightly during installation.

The finished assembly will position the transmitter in the rack as shown here. In this example, the antenna loop through is not being used.

Optional RMPM4T-1 Kit

Rack mount kit for single M4T transmitter.

NOTE: The parts included with each M4T transmitter permits rack mounting of two units.

Replacement Parts

P/N 25989 rack ear flange

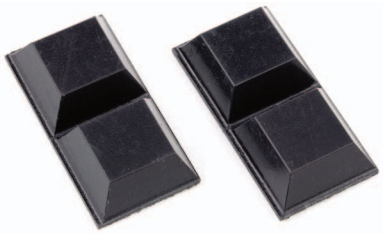
P/N 14247 rack handle

P/N 35702 hex key (allen wrench)

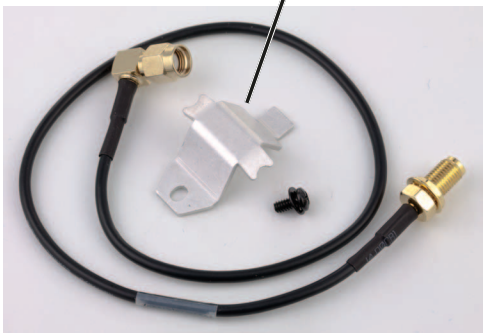
P/N 28885 cap screw; #10-32 9/16 SS (four required for dual rack mount

P/N 25986 retaining clip for power cord

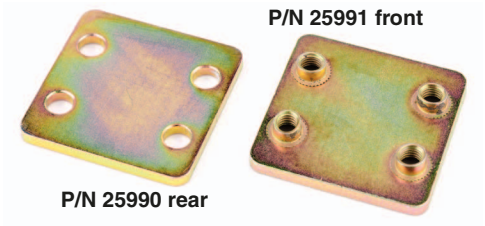
P/N 35664 rubber feet (set of four)



Antenna cable kit



Front and Rear mounting brackets



P/N 21499 power cord, 6 ft. long, NEMA 3-pin plug

P/N 21422 Lectrosonics M4T Antenna

P/N P1264 rack mount hole plug

Firmware Updates

As new versions of the firmware become available, updates are accomplished with a software utility and simple procedure. In many cases, updates must be made to both transmitter and receiver to ensure compatibility and provide the latest feature set.

The software interface operates with Windows 2000, XP, Vista and Windows 7 operating systems.

Configuring the USB Port

1) Remove any previous LecNet2 installation from your computer.

2) Install LecNet2 software. Use the CD supplied with the Quadra system or download the LecNet2 Software Installer or the CD contents from the web site:

   http://www.lectrosonics.com/lecnet2/lecnet2.htm

3) On the same web page, scroll down to *LecNet2 Firmware Updates*. Download the latest firmware files and store them in a convenient directory on your local hard drive. The files are stored on the web site as *.zip* files. After they are extracted the filename extension is *.rpd*. There are separate files for the receiver and the transmitter.

4) Install batteries or connect power to the unit.

5) Plug the USB cable into the unit. If this is the first time this unit has been connected to this computer, Windows will ask for a driver location. The default directory used by the LecNet2 installer is:

   c:\Program Files\Lectrosonics\LecNet2\drivers

   Once the driver is located, Windows will complete the installation and display a message stating that the USB device is now ready to be used.

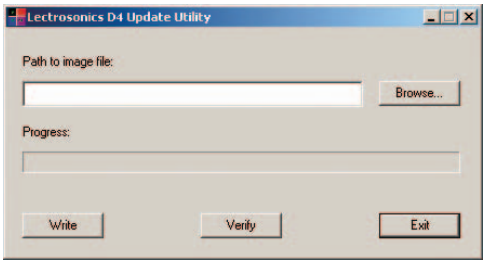
   NOTE: If a message appears during installation stating that the driver is not signed by Microsoft, click on *Continue* to finish the installation.

Installing the Firmware

Make certain that the USB port is configured to communicate with the unit. If not, follow the procedure outlined above to install the USB driver.

Launch the utility:

Start>All Programs>LecNet2>Tools>D4/M4 Update Utility



The *Browse* button is used to select the file to be loaded into the unit.

The *Write* button initiates the installation process.

The *Verify* button on the Utility program control panel is used to compare the version of the selected file with that of the firmware installed in the unit. Clicking the button will start the process. After a few seconds, an *OK* screen will appear if the versions are the same, or a *mismatch* screen will appear if the versions are different.

NOTE: Verification takes place automatically during the installation process launched by clicking the *Write* button.

The firmware version in the unit is displayed briefly on the LCD during the turn-on cycle. The version of the downloaded firmware file is indicated by its filename.

1) Click on the *Browse* button and select the folder where the downloaded firmware files are stored. Select the correct file for either the receiver or transmitter, whichever is connected.

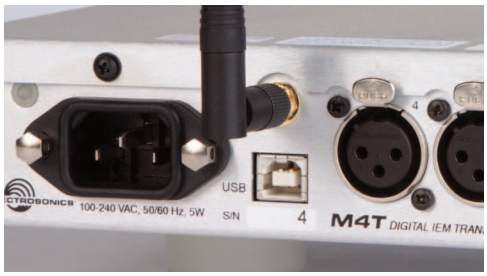
2) Click the *Write* button to copy the new firmware into the unit. The progress bar will indicate as the firmware is being updated.

3) After about 30 seconds an *OK* message will appear if the installation was successful.

4) Click the *Exit* button to close the software panel.

If the wrong firmware is installed into a unit (such as the M4R receiver firmware being loaded into the M4T transmitter) the installation process will appear to work but the LCD on the unit will likely be blank and the unit will not operate. Installing the correct firmware will restore the unit to normal operation.

The USB port is on the side panel of the receiver and on the rear panel of the transmitter.



Troubleshooting Guide

Symptom	Cause	Action
Transmitter and receiver on, receiver shows strong RF signal, but no blue RF LED on receiver and no audio	Transmitter and receiver are not both using the same channel setup	Decide which channel setup (2-channel, 4-channel, or split modes) you plan to use and set both the transmitter and receiver the same. Remember that for split modes to work on the receiver, the transmitter must be set to 4-channel mode.
Low audio level at receiver with analog inputs at transmitter	Transmitter audio trims not set correctly or overall send level from the console is too low	Reduce attentuation (increase signal level) at the transmitter by using the Audio Trim menu. Input trims are set to -20 dB at the factory. Or, increase the send level or mix level from the console.
Low audio level at receiver with digital inputs at transmitter	Overall send level too low at the monitor console	Increase the send level or mix level to the digital output buss on the mixing console.
The audio at the receiver is distorted, using analog signals at the transmitter	The transmitter is being overdriven at the inputs	Reduce the level of the sends from the mixing console, or increase the amount of attenuation at the transmitter by using the Audio Trim menu page.
The audio at the receiver is distorted, using digital signals at the transmitter	The mix is being clipped before it gets to the transmitter	Reduce the overall level of your mix at the console before sending to the transmitter.
The audio sounds very “bright” at the receiver but not when monitoring the same channels at the transmitter	HF boost is engaged at the receiver	Check the settings for the HF boost in the receiver menu. Re-set to taste. Most often, no HF boost is needed since the Quadra system audio response extends to 20 kHz.
I hear channels 3 and 4 at the receiver, but not 1 and 2	Split 3-4 mode is engaged at the receiver	Change the channel setup to 4-channel mode using the Chan. Setup page in the receiver.
Audio channels are missing at the receiver (you are expecting four channels but only receive 2)	Incorrect Channel Setup	Decide which channel setup (2-channel, 4-channel, or Split modes) you plan to use and set both the transmitter and receiver the same. Remember that for split modes to work on the receiver, the transmitter must be set to 4-channel mode.
One or more of the audio channels at the receiver are only heard in one ear	Stereo balance and/or Panning setups are incorrect	Check the panning menu on the receiver and adjust the balance and/or pan controls to place the appropriate channels where you would like them in the stereo field.
One or more of the audio channels at the receiver are only heard in one ear	Audio only being sent to one channel of the transmitter.	Check the connections between the mixing console and the transmitter. If both (or multiple) channels are connected properly, check to make sure the mix from the console has information on all channels.
The system is exhibiting poor operating range	An interfering signal is present	Choose an operating frequency that does not already have a strong signal present. See Tuning, pp. 12 and 18.
The system is exhibiting poor operating range	The receiver antennas are contacting the performer’s body or another conductive surface	Place the receiver so that the antennas are not obstructed by metallic fabric nor contacting the wearer’s skin directly. The antennas should not be folded or “scrunched”. Do not place the receiver in the wearer’s pocket.
The system is exhibiting poor operating range	The transmitter antenna is not connected properly or signal is being filtered improperly	Check your transmitter connection/s, and ensure that if the signal is passing through any other type of device that the device does not filter out the 902-928 MHz frequencies.
Receiver battery life seems very short	Incorrect battery type, poorly charged batteries or partly discharged batteries	Please use only fresh, known-quality alkaline, lithium, or freshly charged rechargeable batteries. You should get at least 6 hours operating time with name-brand alkaline AA batteries, and more with lithium or good rechargeable batteries.
The LCD is dark and impossible to read	LCD has “timed out”	Push any button to turn on the LCD backlight. Depending on how it is set in the menu, it will time out in 30 seconds, 5 minutes, or never.

Service and Repair

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check the interconnecting cables and then go through the **Troubleshooting** section in this manual.

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working**.

Lectrosonics' Service Department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out-of-warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out-of-warranty repairs.

Returning Units for Repair

For timely service, please follow the steps below:

A. DO NOT return equipment to the factory for repair without first contacting us by email or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 A.M. to 4 P.M. (U.S. Mountain Standard Time).

B. After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the **outside** of the shipping container.

C. Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.

D. We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Lectrosonics USA:

Mailing address:
Lectrosonics, Inc.
PO Box 15900
Rio Rancho, NM 87174
USA

Shipping address:
Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124
USA

Telephone:
(505) 892-4501
(800) 821-1121 Toll-free
(505) 892-6243 Fax

Web:
www.lectrosonics.com

E-mail:
sales@lectrosonics.com

Lectrosonics Canada:

Mailing Address:
49 Spadina Avenue,
Suite 303A
Toronto, Ontario M5V 2J1

Telephone:
(416) 596-2202
(877) 753-2876 Toll-free
(877-7LECTRO)
(416) 596-6648 Fax

E-mail:
Sales: colinb@lectrosonics.com
Service: joeb@lectrosonics.com

Specifications

Overall System

Operating Spectrum:	902 - 928 MHz
Center Frequencies (MHz):	
4-channel Mode:	907.776, 912.384, 916.992, 923.904 Four 4-channel systems can operate simultaneously for a total of 16 audio channels.
Center Frequencies: (MHz):	
2-channel Mode:	906.624, 908.928, 911.232, 913.536, 915.840, 918.144, 922.752, 925.056 Eight 2-channel systems can operate simultaneously for a total of 16 audio channels
Modulation Type:	Differential QPSK with Forward Error Correction, spread spectrum
Occupied Bandwidth:	4 MHz (4-channel mode), 2 MHz (2-channel mode)
Audio Sampling:	48 kHz, 24-bit
Latency (overall system):	
Digital:	Less than 0.5 mS
Analog:	1.0 mS
Selectable Audio Inputs:	4 digital 2 digital, 2 analog 4 analog
Audio Performance (overall system):	
Frequency Response:	20 Hz - 20 kHz, +/– 0.5 dB
THD+N:	< 0.05% (1 kHz @ –10 dBFS)
Dynamic Range:	> 95 dB A-weighted
Adjacent Channel Isolation:	> 100 dB

M4T Transmitter

Power output:	200 mW
Audio Input:	Simulated transformer balanced inputs, clip level adjustable +0 to +20 dBu (or AES/EBU digital standard)
Power requirements:	100 - 240 VAC
Power consumption:	5 Watts
Dimensions:	Height: 1.750 in. / 44.45 mm. Width: 8.375 in. / 212.7 mm. Depth: 7.750 in. / 196.8 mm.
Weight:	2.36 lbs.; 1068 grams

M4R Receiver

Diversity Type:	Switched antenna
Audio Output:	Earphone: 100 mW at 32 Ohms
Power requirements:	3 x AA batteries (4.5V)
Power consumption:	1200 mW
Dimensions:	Height: 4.725 in. / 120 mm. (with knobs) 3.735 in. / 94.87 mm. (housing) Width: 2.75 in. / 69.85 mm. Depth: .960 in. / 24.38 mm.
Weight:	9.14 ounces / 259 grams (with alkaline batteries)

Specifications subject to change without notice.

LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liablility of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

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