INSTRUCTION MANUAL

M2T-X* and M2T-X/ND*

M2T-X Dante
M2T-X Non Dante
M2T-X/E01 Dante
M2T-X/E01 Non Dante
M2T/E02
M2T-X/E06

Dante®

*** M2T-X is a firmware option for the M2T allowing encryption and removing the flexlist feature.**

CE

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Fill in for your records:

Serial Number:

Purchase Date:

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Rio Rancho, NM, USA
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Introduction

The M2T Digital Half-Rack Transmitter with analog and digital Dante™ (optional) network audio inputs presents an excellent sounding IEM system with a unique level of performance in a wireless in-ear monitor system. With ultra-low latency, digital RF modulation and two stereo digital channels, the M2T provides a truly unique IEM product for demanding, professional applications.

The M2T boasts a USB port for firmware updates and an IR port for fast setup. A large, high resolution, backlit LCD and large membrane switches provide an intuitive interface that is highly visible in daylight or dimly lit conditions.

The half-rack transmitter provides four audio inputs which can be individually configured to be analog or Dante compatible. The input connectors are full size XLR/TRS combo types for balanced line level analog signals. Input preamp circuits use a special balanced amplifier with very high common mode rejection to minimize hum and noise. Analog signals are converted to an internal digital format which is then encoded, encrypted, organized into packets, and passed to an RF modulator. The modulated RF signal is filtered before and after amplification to suppress out-of-band noise and spurious signals.

Conventional in-ear wireless monitor systems rely on decades-old technology: FM transmission with multiplexed, companded audio. The M2T Transmitter employs unique technology to provide ruler-flat frequency response from 20 Hz to 15 kHz and maximum channel separation. In addition, the digital audio eliminates a compandor and the associated artifacts. The result is crystal clear sound and extremely low distortion
of <0.15%.

The M2T is designed and developed with the professional touring, installation, theater and broadcast customers in mind. The transmitter chassis is all-metal. The front panel is an aluminum extrusion with a durable powder coat finish.

Encryption

The special firmware version M2T-X provides AES 256 bit encryption. When transmitting audio, there are situations where privacy is essential, such as during professional sporting events, in court rooms or private meetings. High entropy encryption keys are first created by the M2T-X Transmitter. The key is then synced with an encryption capable receiver via the IR port. The audio will be encrypted and can only be decoded and heard if both the transmitter and the receiver have the matching key.

What is Dante?

Audinate's patent pending Dante™ technology is a flexible Internet Protocol (IP) and Ethernet based digital AV network technology that eliminates the many bulky cables needed to provide point-to-point wiring for analog AV installations.

With Dante, existing infrastructure can be used for high performance audio as well as for ordinary control, monitoring or business data traffic. Digital networks utilize standard IP over Ethernet offering high bandwidth capable of transporting hundreds of high quality channels over Gigabit Ethernet.

Set-up and configuring the system is made easy as well, saving enormous installation costs and long term cost of ownership on a digital network. The physical connecting point is irrelevant: audio signals can be made available anywhere and everywhere. Patching and routing now become logical functions configured in software, not via physical wired links

Summary of Dante Benefits

- Plug-and-play technology – automatic discovery and simple signal routing
- Reduced Cost & Complexity- No special skills required to set up audio networking
- Sample accurate playback synchronization
- Add/remove/rearrange components at will
- Deterministic latency throughout the network
- Support mixed bit depths and mixed sample rates over one network
- Scalable, flexible network topology supporting a large number of senders and receivers
- Supports 1Gbps networks
- Supports a single integrated network for audio, video, control, monitoring
- Uses inexpensive, off-the-shelf computer networking equipment

System Setup Procedures

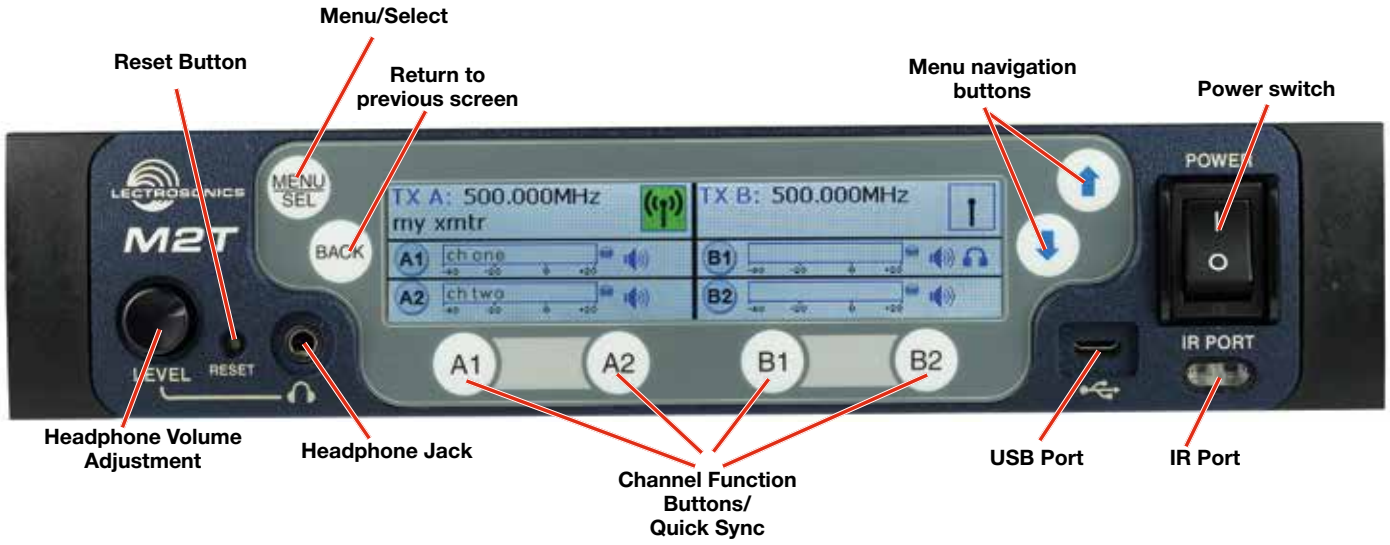
Summary of Steps

1) Connect M2T power using supplied DCR15/4AU power supply, and power on the transmitter (RF off).
2) Power receiver and scan RF spectrum on site.
3) Sync Scan to transfer information from receiver to transmitter.
4) Tune transmitter to unoccupied channels in scan.
5) Choose an encryption key type.
6) Sync receiver with transmitter (see **Sync Key**).
7) Turn on transmitter RF.
8) Send audio sources to transmitter.

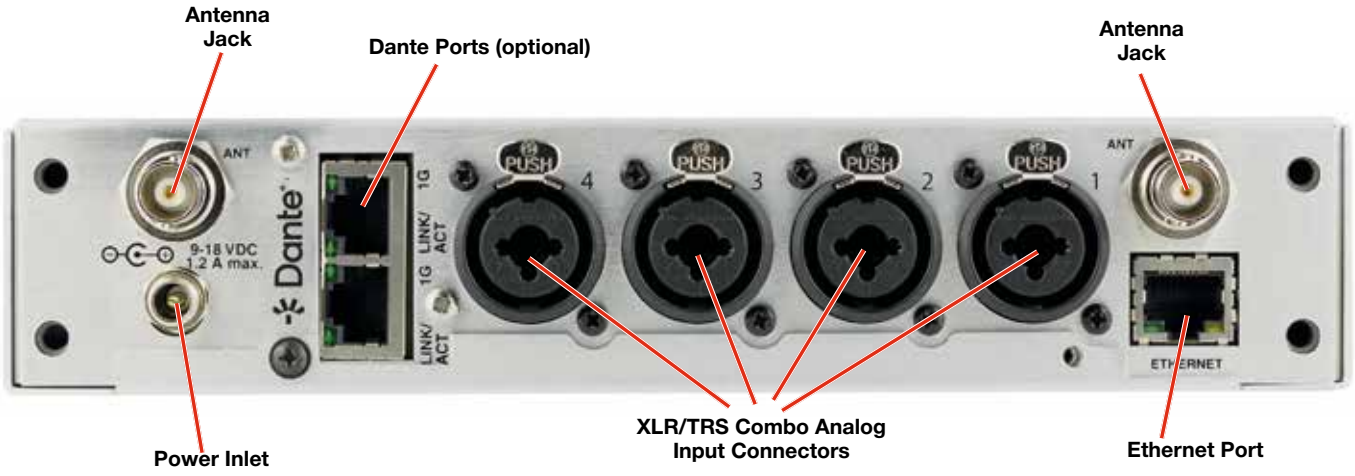
WARNING: Increasing the Pregain can make headphone volume excessively loud. Use caution when setting and using.

Panels and Features

M2T Front Panel



M2T Back Panel



Operating Instructions

IR (infrared) Port

Settings, including frequency, name, limiter, mix mode, encryption keys, etc. can be transferred to and from the M2T transmitter via this port to an IR enabled receiver to simplify setup.

USB Port

For firmware updates and connection to Wireless Designer Software.

Reset Button

For MCU recovery in the event of an interrupted firmware update.

Headphone Volume Adjustment

Adjust the headphone volume, and select source with A1, A2, B1, B2 buttons.

Antenna Output Jacks

Two standard 50 ohm BNC connectors can be used with whip antennas or coaxial cable connected to remote antennas.

Dante Ports (optional)

A Dante Digital Audio Network Interface.

Ethernet Port

Used for setup, monitoring and control with Wireless Designer Software.

Power Inlet

The threaded-locking DC coaxial jack accepts 9-18 VDC and draws 1.2A maximum.

Quick Sync

Sync an M2R rapidly by utilizing the Channel Function Buttons. A long (1 second) press of one of the buttons (A1, A2, B1, or B2) on the front panel initiates Quick Sync. Two options are available, “SYNC ALL” or “SPLIT MONO”. The mode is selected prior to sync in the Front Panel Setup menu item.

NOTE: See Front Panel Setup for more instruction on the Quick Sync function.

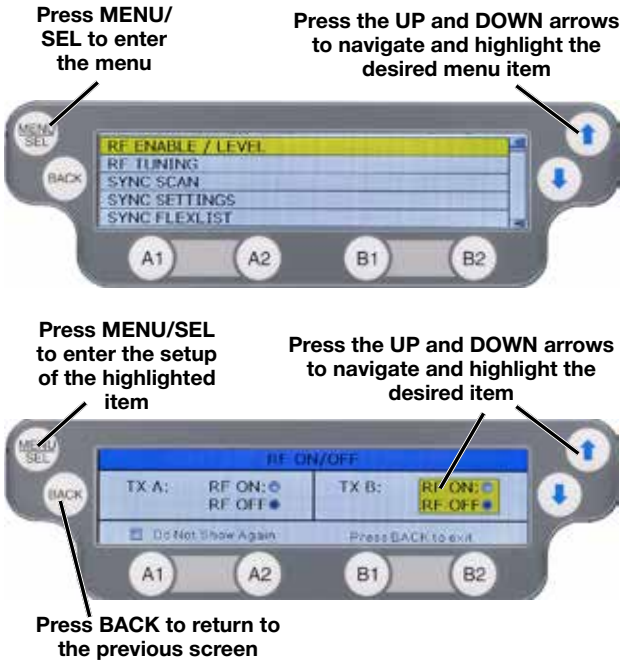
Power Screens

When powering on the M2T, there are two screens that appear in the following order, Duet and Lectrosonics:

Navigating the Menus

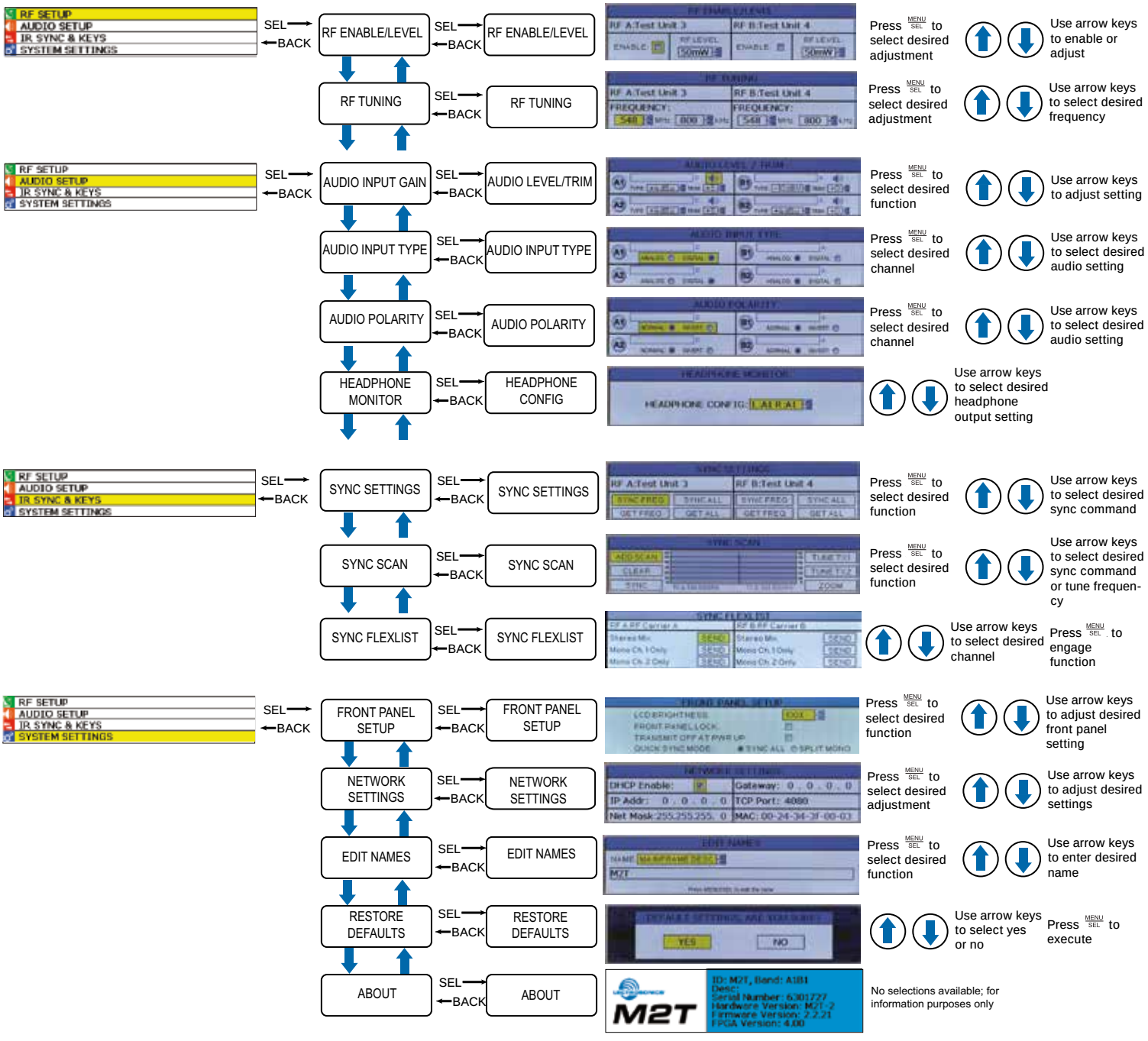
All Menu setup items are arranged in a vertical list on the LCD. Press MENU/SEL to enter the menu, then navigate with the UP and DOWN arrows to highlight the desired setup item. Refer to the menu map on the following page.

NOTE: To guarantee chosen parameters are saved, exit a setup screen ***BEFORE*** powering down M2T.



LCD Menu Map

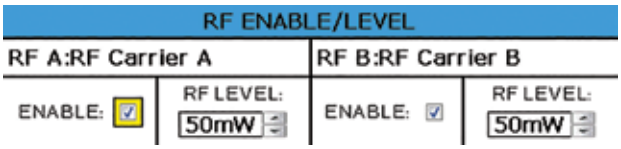
Main Menu Tree



Menu Item Descriptions

RF Enable/Level

Allows RF transmission to be turned on and off and set RF levels at 10, 25 or 50 mW (E06 options are 20, 50 or 100 mW EIRP).



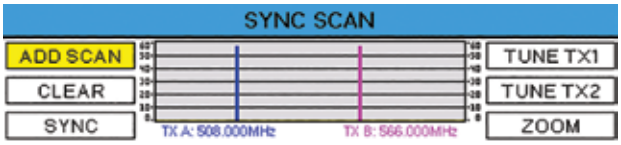
NOTE: Simultaneous long press of A1/A2 (TX A) or B1/B2 (TX B) will also enable or disable RF from main screen.

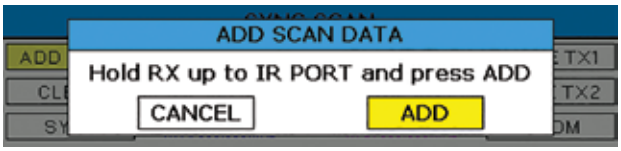
RF Tuning

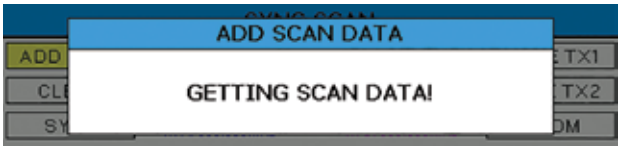
Allows manual selection of the operating frequency.

Sync Scan

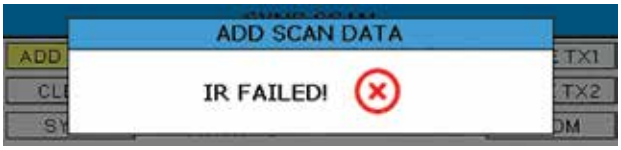
Receive frequency scan via IR port or tune transmitters manually.







Screen will alert user if scan is unsuccessful.



Sync FlexList Profile

FlexList allows the user to set up a list of profiles, by name, in the receiver. This allows quick and easily access to listen to any of the mixes on site.

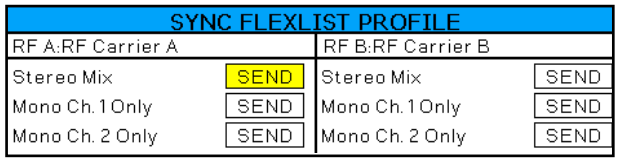
After putting the receiver into Sync Flex mode, choose the function and then use the transmitter to send the profile over IR:

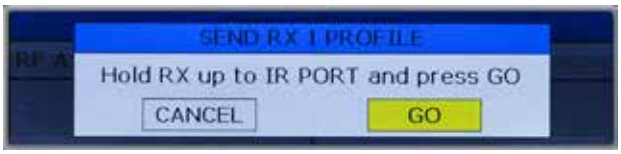
Stereo Mix: The current receiver settings are sent as is, except the mix mode is set to stereo.

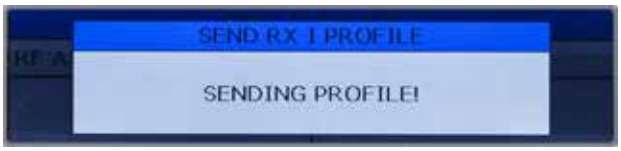
Mono Ch. 1 Only: The current receiver settings are sent as is, except the mix mode is set to Mono Ch. 1.

Mono Ch. 2 Only: The current receiver settings are sent as is, except the mix mode is set to Mono Ch. 2.

NOTE: See Mix Mode for more information.



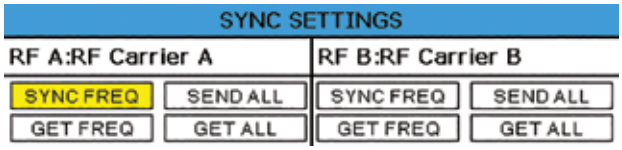




Sync Settings

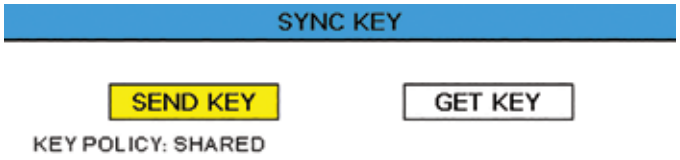
Allows sending or retrieving setup data, including frequency, name and talkback settings, via the IR port.

Sync options: Choose to send frequency, send all settings, retrieve (get) frequency or retrieve (get) all settings from a receiver. Use the **UP** and **DOWN** arrows to select a function and **MENU/SEL** to initiate sync.



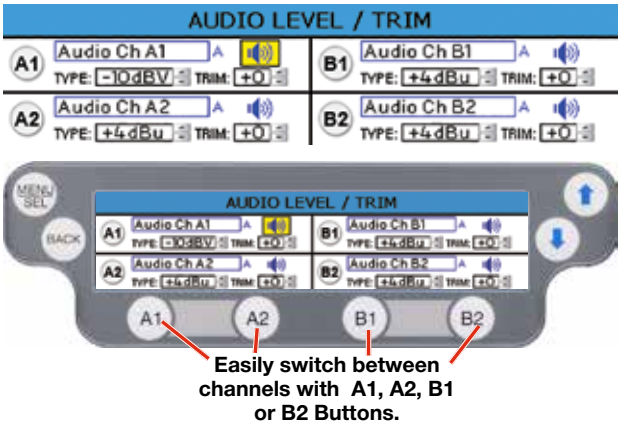
Sync Key

Send or retrieve (get) encryption keys.



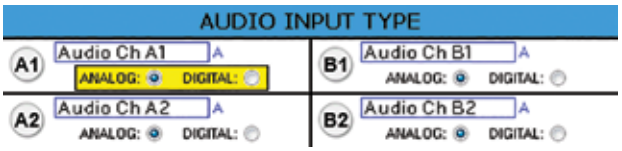
Audio Level/Trim (Audio Input Gain)

Set audio inputs at correct levels.



Audio Input Type

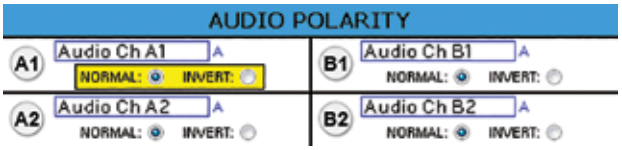
Set independent channels to analog or digital (Dante), if available.



NOTE: When selecting a Dante input, user must be familiar with the Dante Controller from Audinate.

Audio Polarity

Select normal or inverted polarity for each audio channel.



Headphone Monitor

The headphone source can be selected here or on the front panel, using the A1, A2, B1 or B2 Buttons.

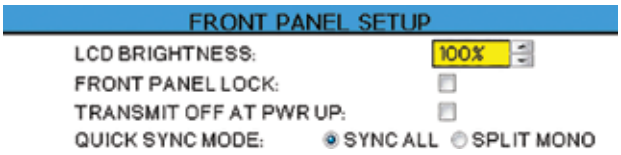
Front Panel Setup

Front panel settings may be customized as follows:

- LCD brightness
- Front panel lock
- Startup RF state
- Quick Sync Mode

Sync All: A long (1 second) press of either the A1, A2, B1 or B2 buttons sends all RX1 settings.

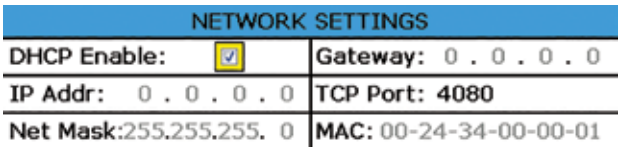
Split Mono: A long press of the A1or B1 buttons sends all RX1 settings with the mix mode forced to Mono Ch. 1. A long press of the A2 or B2 buttons sends all RX1 settings with the mix mode forced to Mono Ch. 2.



Network Settings

Allows the user to set IP address or other network settings when needed.

NOTE: New network settings require the unit to reboot to take effect. Making a change and pressing the BACK key will prompt the user to Reboot Now, Save and Exit, or Discard and Exit.



Encryption Key Management

The M2T-X Version has four options for encryption keys:

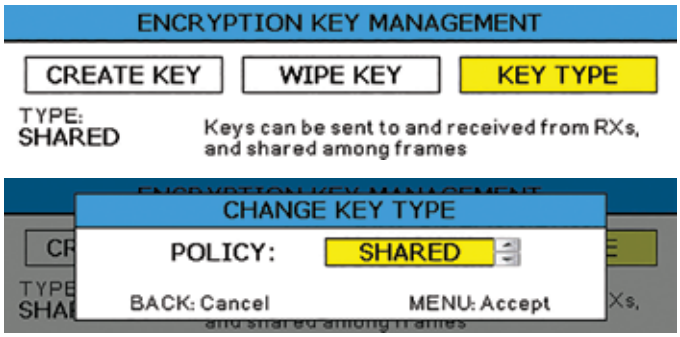
- **Volatile:** This one-time only key is the highest level of encryption security. The Volatile Key exists only as long as the power on both the M2T-X Transmitter and the receiver remains on during a single session. If the receiver is powered off, but the M2T-X has remained turned on, the Volatile Key must be sent to the receiver again. If the power is turned off on the M2T-X, the entire session concludes and a new Volatile Key must be genereated and sent to all receivers via the IR port.
- **Standard:** Standard Keys are unique to the M2T-X. The M2T-X generates the Standard Key, and the key may only be transferred to one receiver. The receiver is the sole source of the Standard Key, and because of this, the M2T-X may not receive (get) any Standard Keys.
- **Shared:** There are an unlimited number of Shared Keys available. Once generated by the M2T-X and transferred to a receiver, the encryption key is available to be shared (synced) by the receiver with other transmitters/receivers via the IR port.
- **Universal:** This is the most convenient encryption option available. All encryption-capable Lectrosonics transmitters and receivers contain the Universal Key. The key does not have to be generated by the M2T-X. Simply set a Lectrosonics encryption-capable transmitter and the M2T-X to Universal, and the encryption is in place. This

allows for convenient encryption amongst multiple transmitters and receivers, but not as secure as creating a unique key.

Encryption Keys

The M2T-X generates high entropy encryption keys to sync with encryption-capable receivers. The user must select a key type and create a key in the M2T-X, and then sync the key with a receiver.

1. Begin by selecting a key type.



2. The M2T-X will then display a warning to indicate that all receivers will need a new key. Select **CREATE KEY** to generate a new key.

NOTE: When Universal Key type is selected, there is no prompt to create key. See Encryption Key Management for more information.

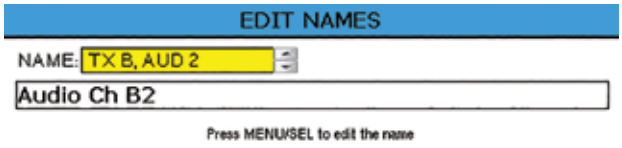
3. A message will pop up on the screen warning the user that all receivers will need a new key. Select OK. The creation of a new key is confirmed.

4. Sync new key with receiver (see **Sync Key**). The transmitted audio will then be encrypted with the new key.

Edit Names

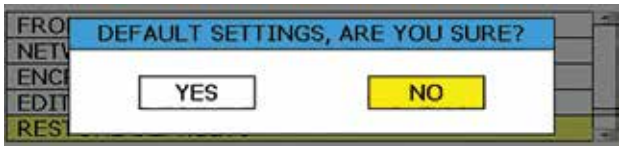
Edit names to match talent for easy location or easily identify multiple M2T transmitters in a rack.

- Use UP and DOWN Arrows to select letters and MENU/SEL to set and move cursor.



Restore Defaults

Returns all settings to the factory defaults.



About

Displays general information about the M2T-X, including serial number, and the hardware, FPGA and microcontroller firmware versions.

Wireless Designer Software

Download the Wireless Designer software installer from the web sites under the SUPPORT tab at:

http://www.lectrosonics.com/US

Wireless Designer only needs to be installed the first time the software is used. Once the software is installed, updates are available by simply clicking on an item in the Help Menu.

NOTE: If Wireless Designer is already installed, you must uninstall it before attempting to install a new copy.

Firmware Update Instructions

Firmware updates are made with a file downloaded from the web site and the M2T connected via USB.

The USB port on the transmitter requires a micro-B male plug on the connecting cable. The other end of the cable would normally be a USB A-Type male connectorto fit the most common type of USB jack used on computers.

Refer to ***Help*** in Wireless Designer software for the procedure.

Hardware Installation

Unpacking the Unit

Compare the packing list enclosed with the M2T with the original order. Inspect all items for damage. Immediately call 1-800-821-1121 to report any items that are missing or damaged. The sooner we get notified, the sooner we can get any needed replacement items shipped to your location.

Items Included in the Box:

- Instruction manual
- (DCR15/4AU) Power supply cable
- (21926) USB cable
- (35800) Hex L key wrench
- (25990) Bracket rear tie
- (25991) Bracket front tie
- (27076) Rack flange bracket
- (27082) Rack handle
- (28885) (4) SCR10 cap screw
- (35664) (4) Rubber foot large
- (35959) Hole plug
- (A500RA19) (2) Antennas
  (A500RA22) (2) Antennas
  A1B1 Units
- (A500RA22) (2) Antennas
  (A500RA25) (2) Antennas
  B1C1 Units

Installing two M2T Transmitters into a Single Rack Space

The M2T transmitter occupies a half rack space, and comes with hardware to mount two transmitters into a single rack space.

1. Remove the Trim Cap (Part #P1330) from both sides of the front panel on both transmitters.

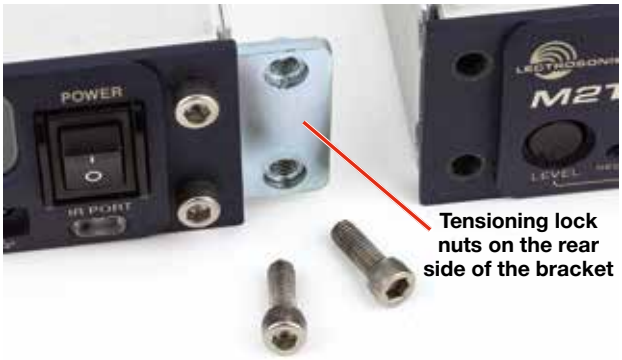
2. Remove the breakaway tabs on both sides of the chassis side panels. Use a flat blade screwdriver to pry the tabs outward and snap them off of the chassis.

3. Insert the flange bracket (Part #27076) into the open slot in the side of the chassis cover panel.

4. Insert two (2) cap screws (Part #28885) through the rack handle (Part #27082) holes and install the rack handle onto the flange bracket through the holes in the unit's front panel. Firmly tighten the cap screws using the hex key (Allen wrench) as shown.

5. If antennas will NOT be mounted on the front panel of the transmitters, install the hole cap (Part #35959) by aligning the flat on the cap with the flat on the opening.

NOTE: The retaining nuts on the panel and tie brackets are "tensioning lock nut" types designed to prevent the screws from coming loose due to vibration. You will usually feel resistance as you tighten the screws - this is normal.



6. Install one side of the front tie bracket (Part #25991) into the side panel opening in one of the transmitters. Insert the screws, but do not tighten them completely at this point.

Slide the other transmitter over the tie bracket and insert the screws, but do not tighten them completely until the rear tie bracket is installed.

7. Remove the four cap screws from the adjacent rear panels, and then use them to attach the rear tie bracket. Do not tighten the screws completely.

8. After front and rear tie brackets are installed, place the transmitters on a flat surface so the that the front panels are even with each other. Hold the transmitters in place and tighten all cap screws on the front and rear brackets.

NOTE: If the supplied rubber feet are installed on under side of M2T, it will not fit in a rack unless there is an empty space below it.

Accessories

DCR15/4AU

Front Mount Antenna Kit FMAKM2T

27080 Dante Port Cover
(included with Non-Dante Model)

Dante 4X4-TM Dante Card Kit
(Included in Dante Model)

RMPM2T-1
Rack kit for mounting one M2T into a single rack space

SNA600a Antenna

SNA600a Accessories:

ARG 15
A 15 foot antenna cable of standard RG-58 coax cable with BNC connectors at each end.

ARG 25; ARG 50; ARG 100
Antenna cable of Belden 9913F low-loss coax cable with BNC connectors at each end. Number specifies length in feet.

Specifications

RF Power Output:	• Two carriers; two audio channels each • M2T, M2T/E02: Power adjustable on each carrier to 10, 25 or 50 mW • M2T/E06: Power adjustable on each carrier to 20, 50 or 100 mW EIRP
Antenna Output:	2 x BNC sockets
Operating Frequencies:	M2T: 470.100 – 607.975 MHz M2T/E02: 470.150 - 614.375 MHz M2T/E01: 470.10 – 614.375 MHz M2T/E06: 520.000 - 614.375 MHz

NOTE: It's the user's responsibility to select the approved frequencies for the region where the transmitter is operating

Frequency Selection Steps:	25 kHz
Frequency Stability:	± 0.002%
Modulation:	8 PSK
Emission Designator:	200KG7E
Spurious Radiation:	Compliant with ETSI EN 300 422-1
Encryption:	AES 256-CTR (per FIPS 197 and FIPS 140-2)
Equivalent input Noise:	–128 dBV
Latency: (overall system)	
Digital Source:	1.0 ms plus Dante network (on Dante unit)
Analog Source:	<1.4 ms
Audio Frequency Response:	10 Hz – 11.5 kHz, -1 dB
Audio Input:	-10 dBV or +4 dBu settings w/ ±5 dB trim
Audio Input Jack:	4 x combo XLR/TRS connectors
Input impedance:	Line: 2k Ohm
Dante Connection:	2 x RJ45, 4 audio RX channels, internally routable
Ethernet Connection:	RJ45
USB Connection:	Micro USB on front panel for firmware updates
IRDA:	IR transceiver for sync of receivers
Headphone jack	3.5 mm stereo jack
Power Requirements:	9-18 VDC
Power Consumption:	5 Watts
Weight:	2.2 lbs (997.903 grams)
Dimensions:	Height: 1.750 in. / 44.45 mm Width: 8.375 in. / 212.7 mm Depth: 7.750 in. / 196.8 m.

Specifications subject to change without notice.

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.
561 Laser Rd. NE, Suite 102
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
service.repair@lectrosonics.com

Lectrosonics Canada:

Mailing Address:
720 Spadina Avenue,
Suite 600
Toronto, Ontario M5S 2T9

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

Self-Help Options for Non-Urgent Concerns

Our Facebook groups and weblists are a wealth of knowledge for user questions and information. Refer to:

Lectrosonics General Facebook Group: https://www.facebook.com/groups/69511015699

D Squared, Venue 2 and Wireless Designer Group: https://www.facebook.com/groups/104052953321109

The Wire Lists: https://lectrosonics.com/the-wire-lists.html

ISEDC Notices:

Per RSS-210

This device operates on a no-protection no-interference basis. Should the user seek to obtain protection from other radio services operating in the same TV bands, a radio licence is required. Please consult Industry Canada's document CPC-2-1-28, Optional Licensing for Low-Power Radio Apparatus in the TV Bands, for details.

Ce dispositif fonctionne selon un régime de non-brouillage et de non-protection. Si l'utilisateur devait chercher à obtenir une certaine protection contre d'autres services radio fonctionnant dans les mêmes bandes de télévision, une licence radio serait requise. Pour en savoir plus, veuillez consulter le document CPC-2-1-28 d'Industrie Canada intitulé, Délivrance de licences sur une base volontaire pour les appareils radio de faible puissance exempts de licence et exploités dans les bandes de télévision.

Per RSS-Gen

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1) This device may not cause interference

2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio ex¬empts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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.

LECTROSONICS®

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12 January 2024