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## OTHER MACKENZIE PRODUCT LINES

**Digital Message Repeaters** - Mackenzie's line of Digital Message repeaters are the ideal audio announcement solutions for Public Address, Amusement, Entertainment, Museum and Exhibit applications. Self-contained solid state systems offer unparalleled reliability. A variety of channel, connection, bandwidth and memory configurations are available.

**Controls and Peripherals** - Many applications require additional equipment to optimize the performance of Mackenzie products. This area focuses on items developed or sourced for their compatibility, ease of use and value. Included are: input/output controllers, speakers, amplifiers, motion sensors and pushbuttons among others.

**Transit** - Mackenzie is making a difference in transit applications with innovative solutions for ADA compliance and Passenger Information Systems. These products address a variety of audio and text messaging requirements and support both in-vehicle and wayside installations.

**Overhead Page Management** - Mackenzie's OPM series of Digital Page Stacker/Repeater and Feedback Eliminators offer advanced features for the most difficult paging and intercom applications. A unique design makes feedback virtually impossible by recording then repeating pages which opens the loop between the input microphone and speakers. Various models are available to support simple repetition, multiple page stacking and multiple input channels.

# MACKENZIE.

# minimac 2

### Next Generation
### COMPACT DIGITAL AUDIO MESSAGE REPEATER



## Model #: MMD-USB

### User's Manual
**Version 1.2, Revised 19, January 2016**
**Doc 99-20-199**

## General Safety Instructions

Always follow these basic safety precautions when using the system:

1. Read carefully and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. DO NOT block or cover ventilation slots and openings.
4. DO NOT place the product in a closed enclosure or cabinet unless proper ventilation is provided.
5. Never spill liquid on the product or drop objects into the ventilation slots and openings. Doing so may result in serious damage to the components.
6. Repair or service must be performed by a factory authorized repair facility.
7. A UL/CSA approved power pack is provided, when ordered.
8. DO NOT staple or otherwise attach the power supply cord to building surface.
9. DO NOT use the product near or in wet or damp places, such as wet basements.
10. DO NOT use extension cords. Install within six feet of a grounded outlet receptacle.
11. DO NOT install during lightning storm.
12. Never touch un-insulated wires or terminals unless the unit is disconnected from both power and the rest of the phone system.
13. Use Caution when installing or modifying configuration switches or control lines.
14. The unit must be securely attached to a wall board, rack or table mounted.

> ⚠ **CAUTION:** If any wiring from the system leaves the premises, you must use proper electrical protectors.

### Regulations:

### FCC (Part 15) Radio Frequency Interference

The Minimac2 generates and uses radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. Unit complies with the limits for Class A devices in accordance with the specifications in Subpart J of Part 15 of the FCC Rules. This testing is designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the unit off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient the radio or TV receiving antenna.

-Relocate the unit with respect to the radio or TV receiver or vice-versa.

-Plug the unit into a different outlet so that it and the radio or TV receiver are on different branch circuits

-If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

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Warranty & Registration Card for the
## Minimac2 - COMPACT AUDIO MESSAGE REPEATER

Date:_____          Serial No.: _____

Purchaser:  _____

Address:     _____

City:         _____     State: _____      Zip:    _____

Phone:  _____     Fax: _____      Email: _____

Seller:  _____

Address:_____

City:         _____     State: _____      Zip:    _____

Phone:  _____     Fax: _____      Email: _____

Return warranty card via:

FAX: (909) 394-9411
MAIL: Address on reverse side
ONLINE: www.macklabs.com/registration.html

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**NOTES**

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## 4. WARRANTY, SERVICE & RETURNS

The industrial grade housing and quality construction of the Mackenzie Minimac2 virtually eliminates the need for service or maintenance. There are no user-serviceable components within the Mackenzie Minimac2. Refer all servicing to the factory.

### 4.1 Warranty Coverage:

The Mackenzie Minimac2 is tested and checked before shipment and is guaranteed against defective material or workmanship for a period of one (1) year from the date of purchase. Should trouble ever develop, contact the Factory directly by telephone or in writing. If it is determined that the equipment requires Factory service, return it to the Factory. If our inspection shows that the trouble was caused by defective material or workmanship, we will repair or replace the equipment without charge and return prepaid. Repairs made necessary by abuse, improper use, unauthorized service or maintenance, and/or improper installation, as well as out of warranty repairs, will be charged at our regular repair prices
in effect at the time. The obligation under this warranty shall be limited to the replacement, repair or refund of any such defective device within the warranty period, at Mackenzie's discretion.

This warranty is in lieu of and excludes all other warranties, expressed or implied, and in no event shall MACKENZIE be responsible for damage to other equipment or property, for any anticipated profits, consequential damages, loss of item, or other operation or use of this product, and MACKENZIE'S maximum liability shall not ever be greater than the price paid for the equipment. This warranty gives you specific legal rights. Your rights may vary from state to state. Inquiries regarding use, repair and service should be made to:

MACKENZIE LABORATORIES, INC.
1163 Nicole Court, Glendora, CA 91740 USA
Telephone: (909) 394-9007 / FAX No: (909) 394-9411

### 4.2 What we ask you to do:

To get warranty service for your Minimac2 system, you must provide proof of the date of original purchase. In the event you need to ship your Minimac2 system to the factory for service, call us for a return authorization number. When you ship your Minimac2 system, you must prepay all shipping cost. We suggest that you retain your original packing material in the event that you need to ship your Minimac2 system. When sending your Minimac2 system to the factory, include your name, address, phone number, proof of date of purchase, and a description of the operating problem. After repairing or replacing your Minimac2 system, we will ship it to your return address at no cost to you within the USA. Repair or replacement of your Minimac2 system at our factory is your exclusive remedy.

### 4.3 What this warranty does not cover:

This warranty does not cover defects resulting from accidents, damage while in transit to factory, alterations, unauthorized repairs, failure to follow instructions, misuse, fire, flood and acts of God.

# Table of Contents

### Shipping Container Contents

The following items should be found in the container of Minimac2, Compact Digital Audio Message Repeater:
- MMD-USB System
- Installation and User Guide
- Mounting screws
- <Any optional accessories ordered>

### Hardware Configurations

- Minimac2; Four messages, >16 hours storage time, 2.5 watt amp
- Minimac2 / 10W; Four messages, >16 hours storage time, 10 watt amp

### Optional Accessories:

- Power Pack, 12 VDC, 1amp, 115V 50/60Hz, Order: MM-PS12
- Power Pack, 15 VDC, 0.9amp, 115V 50/60Hz, Order: MM-PS15
- Weather Resistant Speaker with Mount, Order: CS4
- Microwave Motion Sensor, Order: MS-2
- USB Memory Key (<x>GB), Order MUSB-<x>GB

## 1. OVERVIEW

### 1.1 Features and Capabilities

The increased sophistication of today's messaging systems require products that are easily integrated into a wide variety of applications. They must also provide increased intelligibility, system clarity, vocal definition and reliability.

Mackenzie Laboratories, Inc. continues to respond to these requirements with our newest Audio Message Repeater, the Minimac2. Designed for use in the most discriminating of applications, the Minimac2 offers hours of audio storage with excellent audio quality. The Minimac2 allows the user to record up to 4 messages, and enable any one them for repetitive playback, or all the recorded messages can be played in a sequential mode.

Loading the MMD-USB with audio messages can be done locally into non-volatile memory, using the integrated Microphone or line input, or can be recorded in a studio and downloaded over the High Speed USB port.

The space saving built-in 4 watt power amplifier is perfect for most direct to speaker applications as it eliminates the need for additional hardware.

The Minimac2 small size, industrial construction and the absence of moving parts make it ideal for automatic unattended operation, especially in harsh environmental or mobile conditions.

## 1.2 General Specifications

**Audio Coding:**
Recording:    WAV  (44.1kHz, mono)
Playback:     MPEG 1, Layer 3 (VBR) or WAV (44.1kHz)

**Audio Quality:**
Dynamic Range:    80dB, Typical
Signal to Noise:    80dB, Typical
Frequency Resp.:    40Hz to 15kHz
THD:             < 0.5% at 1kHz, Typical

**Audio Input:**
Line:    10k ohm, RCA
Mic:     1.5k ohm, 1/8" mini jack, Low Z
Level:    +4dBm max., adjustable potentiometer

**Audio Output:**
Line:    600 ohm (+3dBm max.), RCA
Amplified:    2.5 watts into 8 ohm, 2 pin pluggable terminal
Level:    Adjustable potentiometer

**Audio Memory:**
Type:    Internal SD Card
Capacity:    1GB, 16+ hours of MP3 audio storage
             1.5+ hours of WAV audio storage

**Power Requirement:**
Input Voltage:12vdc, or 15vdc
Current:    1 amp w/ Power Amp, 250mA w/o Amp
Connection:    2 pin pluggable terminal

**Manual Control Interface:**
Pushbuttons: Record Setup, Start/Stop, Select, Speaker

**Display:**
LEDs:    Memory OK, Message, Record, Play.

**Mechanical:**
Wall mountable chassis, rack mount option
6.5" wide x 4.5" deep x 1.2" high, 2 lbs.
18 gauge cold rolled steel chassis
Texture coated paint process

**Regulatory Agency Approvals:**
FCC, Part 15, Class A
UL/CSA approval on external power pack

### 2.4.2  Start/Stop
Plays default message. Holding button will repeat message. Play LED illuminates during playback with Message LED blinking as to the message number playing.  Pressing this button while playing or recording stops the process.

### 2.4.3  Select
Selects message to play or record. To select the active message, press and hold for 2 seconds.  The Minimac2 will display the location of the current active message on the memory card.  Additional presses will sequence through all valid audio messages, from #1 to #4 as indicated on the Message LED.  A "Play Sequential" mode is indicated by a solid Message LED.  Pressing the Start/Stop pushbutton stores the selected message as the active message.  This setting is saved through power outages.

### 2.4.2  Speaker
Toggles the setting of the on-board monitor speaker, ON/OFF.

## 2.5  LED Descriptions

### 2.5.1  Memory OK LED
Lit when the internal memory is installed with a valid message present. Blinks when the memory is empty.

### 2.5.2  Message LED
Blinks during select, play or record with the message number selected.  The message number is indicated by the system blinking the number of times matching the message number.  Solid indicates sequential play mode.

(e.g.:  blink – blink, pause, blink – blink, pause indicates message #2)

When selecting the message number for recording, the Message LED will indicate if a message is already located in that position by blinking fast.  If the location is empty, the Message LED will blink slowly.

### 2.5.3  Record LED
Blinks when unit is in record setup mode. Solid when unit is recording.

### 2.5.4  Play LED
Illuminates when unit is playing a message.
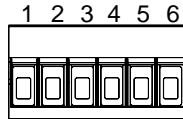
## 3. AUDIO FILE FORMATTING

The Minimac2 can use audio files that are formatted as either *.WAV (44.1kHz, 16 bit) or *.MP3 (44.1kHz, 32-320 kbps, VBR).

- Messages may be mono, or stereo, but unit will only play the left side audio.
- Message lengths can be any size from a couple seconds to several hours.
- Audio files must be named numerically as shown below:
    1.mp3 or 1.wav will be placed in message position 1.
    2.mp3 or 2.wav will be placed in message position 2.
    3.mp3 or 3.wav will be placed in message position 3.
    4.mp3 or 4.wav will be placed in message position 4.
- If more than 4 messages are detected by the system, the messages following the 4th will only be played in sequential mode.
- If the card has two files with the same name, but different suffix, the MP3 file will play and the WAV file will be ignored.

#### 2.2.6. Remote I/O Connector
Six terminal pluggable connector
1 Common
2 Stop, stops playback, if playing
3 Start, plays active message
4 Play Relay Output, Normally Open
5 Play Relay Output, Common
6 Play Relay Output, Normally Closed

1 2 3 4 5 6

#### 2.2.7. USB connector
USB type "A" connector for use with a USB memory key. The Minimac2 will upload or download audio files to or from the USB key based on the folder names on the key. See descriptions of supported folder names:

**"Complete":** ALL files on Minimac will be deleted and replaced with audio files in this folder.
**"Delta":** Audio files of the same name will be replaced with files in this folder.
**"Upload"**: When the Minimac2 detects a memory key with only an empty Upload folder, and not other folders, all audio files will be copied from the Minimac2 into this folder on the memory key.

If both a "Complete" and a "Delta" folder exist on the key, no audio files will be transferred and an error indication will be displayed on the LEDs.

Reference Section 3 for the audio file types supported by the Minimac2.

### 2.3  Audio Control Descriptions

#### 2.3.1. Line Input Level
Potentiometer to adjust Line input level. Range is continuous from -infinity to +0dBm. While recording adjust this setting to provide required level.
#### 2.3.2. Microphone Input Level
Potentiometer to adjust mic. input level. Range is continuous from -infinity to +0dBm. While recording adjust this setting to provide required level.
#### 2.3.3. Tone Level
Potentiometer to adjust tone level. Range is in 1 db steps from +10dB bass & -10dB Treble (Fully CCW) to -10dB bass & +10dB treble (Fully Clockwise). Center position is 0 db bass, 0 db treble
#### 2.3.4. Output Level
Potentiometer to adjust playback level simultaneously on both Line and Speaker output . Range is continuous from -infinity to +4dB.

### 2.4  Pushbutton Descriptions

#### 2.4.1  Record
Press to enter record setup mode, Record LED will blink. Press Select button to choose the message location for recording. Press the Start/Stop button to begin recording, Record LED will be solid. Press the Start/Stop button to stop recording or to exit record mode.
**NOTE: A message may be erased from memory by entering Record Setup mode, selecting the message number to be deleted, and then press and hold the Start/Stop button for approximately 2 seconds.**

## 2. INSTALLATION & CONFIGURATION
This section provides complete instructions for mounting the Minimac2 - compact audio message repeater on a wall or table. It also illustrates all interface requirements to auxiliary equipment, including inputs and outputs.

### 2.1 Installation Steps
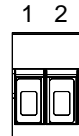These are the general steps for installation:

1. Find a space on the wall or table. For table top applications, install included rubber feet. Allow approximately 6 inches in front of, and 6 inches above the unit for user access to the controls and wiring.
2. Mount the unit to the selected place with its wiring at least 18" away from power supply or other equipment that generates electrical noise.
4. Connect audio inputs and outputs.
5. Connect control inputs and outputs.
6. If you are using the optional power supply, make sure there is a standard, non-switched electrical outlet available.
7. Connect and apply power.
8. Test unit operation.

### 2.2 Connector Descriptions

1 2

#### 2.2.1. Power
Two terminal pluggable connector.
1    12VDC at 1 amp, or 15VDC at 900mA
2    Ground

#### 2.2.2. Mic. Input
Microphone input for recording messages. Mono. 1/8" mini jack. Up to 1.5k ohm impedance. This specification is compatible with most consumer grade microphones (Radio Shack Omni-directional Dynamic P/N 33-2001). **NOTE: Mic input and Line input may not be used at the same time. Make sure Line input is disconnected for the microphone to work properly.**

#### 2.2.3. Line Input
Line level analog audio input for recording messages. Mono. Unbalanced, RCA connection, 10k ohm impedance. Compatible with the unbalanced analog outputs of most tape decks, CD players, DAT players, etc. **NOTE: Line input and Mic input may not be used at the same time.**
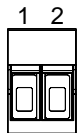
#### 2.2.4. Line Output
Line level analog audio output for playing messages. Mono. Unbalanced, RCA connection, 150 ohm impedance. Compatible with the unbalanced analog inputs of most audio equipment.

#### 2.2.5. 8 Ohm Output
1 2

Two terminal pluggable connector.
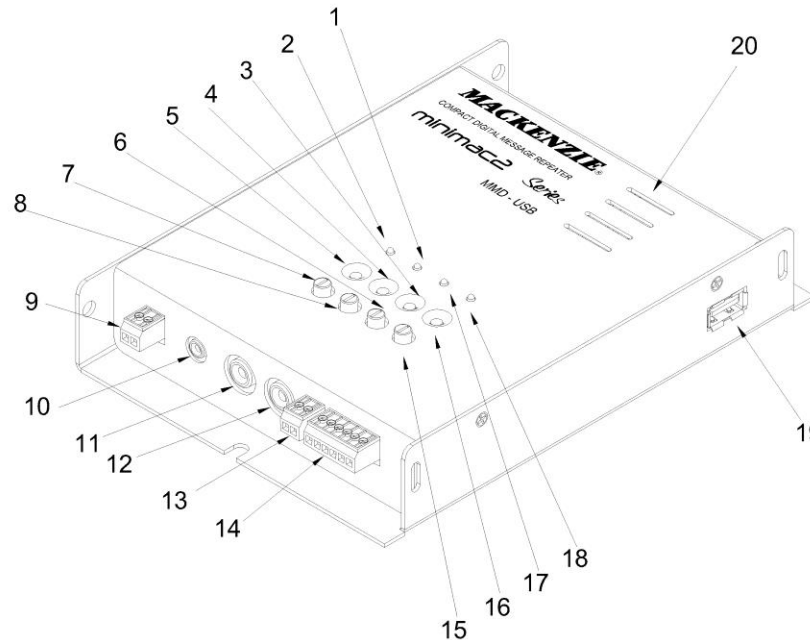1    Bridged amplifier output +
2    Bridged amplifier output  -

CAUTION: Referencing either of the speaker output terminals to ground will cause incorrect operation and may damage the unit. Always connect the speaker directly across the supplied terminal connections.

# MODEL: MMD-USB
## COMPACT AUDIO MESSAGE REPEATER

**1  MESSAGE LED (YELLOW):**
Indicates the message number selecte by number blinks.

**2  MEMORY OK LED (GREEN):**
LED is ON if either an SD Card or a USB memory key with valid audio messages is detected by the system. Blinks if no files are detected.

**3  SELECT PUSHBUTTON:**
Allows user to select the current message position to record into, or play from.

**4  START/STOP PUSHBUTTON:**
Starts or stops recording or playback based on current mode of system.

**5  RECORD PUSHBUTTON:**
Activates record setup mode.

**6  TONE ADJUST KNOB:**
Adjusts the Bass & Treble amount to deliver the best overall system performance.

**7  LINE IN LEVEL KNOB:**
Adjusts the audio level of the line input.

**8  MIC IN LEVEL KNOB:**
Adjusts the audio level of the microphone input.

**9  POWER JACK (2 POS EURO):**
Insert power adapter (sold separately)

**10  MIC INPUT (1/8" MINI JACK):**
Connect low impedance microphone for local recording.

**11  LINE INPUT (RCA JACK):**
Connect line level audio input for local recording.

**12  LINE OUTPUT (RCA JACK):**
Audio output level of up to +3dB into 600 $\Omega$, this is a standard level for most applications.

**13  SPEAKER OUTPUT (2 POS EURO):**
Audio output level of up to 2.5W into 8 Ohm. Use this output if more drive is needed to reach a more comfortable listening level.

**14  REMOTE I/O (6 POS EURO) :**
Provides remote access to Minimac's start and stop control and play relay output.

**15  OUTPUT LEVEL KNOB:**
Adjusts the volume to the both line level and speaker audio outputs.

**16  SPEAKER PUSHBUTTON:**
Turns local Monitor speaker ON/OFF.

**17  RECORD LED (RED):**
Used to display recording mode. Red light ON, indicates message (s) is being copied from USB memory key to SD Card.

**18  PLAYING LED (GREEN):**
This green LED is ON when the system is playing Pre-Recorded messages.

**19  USB MEMORY KEY CONNECTOR:**
Audio files can be copied directly from a USB memory key, to the system's internal memory.

**20  MONITOR SPEAKER:**
Allows user to preview message play back.

## MMD-USB Quikey