INTEGRATED ULTRASOUND MOBILE SPEAKER

Luna Speaker UMS-1

User Manual

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CONTENT

NOTE: Animal Sound Labs reserves the right to make modifications to the parameters and operation without prior notice. Due to the continuous improvement and enhancement process, some of the functions listed in this manual may vary slightly depending on the version of the firmware.

version.1.1, 2018.01.03

1. Introduction

Thank you for purchasing our device!
Luna Speaker UMS-1 is a mobile integrated active broadband active speaker. It combines:
- embedded ultrasonic power amplifier (frequency-corrected to the loudspeaker characteristics);
- 32-point discrete signal level regulator (2 buttons);
- 5-point control display (LED bar) with additional control signaling the amplifier overdrive/clipping (6th red LED);
- Built-in custom modified ultrasonic speaker, internally wired with very short wires to minimize power losses.
- internal (8 AA cells, primary or rechargeable batteries) or external powering (9-15V via PWR connector);

The device is designed for reproduction of sounds or ultrasounds generated by external signal source (ultrasound or audio player like our **LunaLure UMP-1** or **LunaLure UMP-2** devices, computer **USB-DAC** or **DAQ** cards etc.) It can be used, for example to attract bats, birds, testing an ultrasonic detectors, training or other purposes related to the reproduction of sounds or ultrasounds.
Especially in conjunction with our luring devices (LunaLure UMP-1 or LunaLure UMP-2) it can complement and enhance their performance by increasing the radiated power in a given direction or by reproducing signals in a different direction than the player device.
They can be used to reproduce the same signal as the player (eg. **LunaLure UMP-1** or **LunaLure UMP-2**) or to reproduce signal from the second player channel (only **LunaLure UMP-2**).
Luna Speaker UMS-1 can reproduce the signal provided from the external source to the **LINE INPUT** via the signal cable with the corresponding connectors. The signal source can even be a long distance from an active speaker due to the built-in specially designed very broadband and efficient power amplifier with relatively high input impedance.
In addition, there are circuitry that corrects the frequency characteristics of the transducer, which, combined with the increased power of the built-in amplifier, allows the reproduction of a wide range of sounds and ultrasounds to over 140 kHz. The device can also buffer and retransmit the signal and direct it through the **LINE OUTPUT** connector to the next device (eg. another active speaker or mobile player).

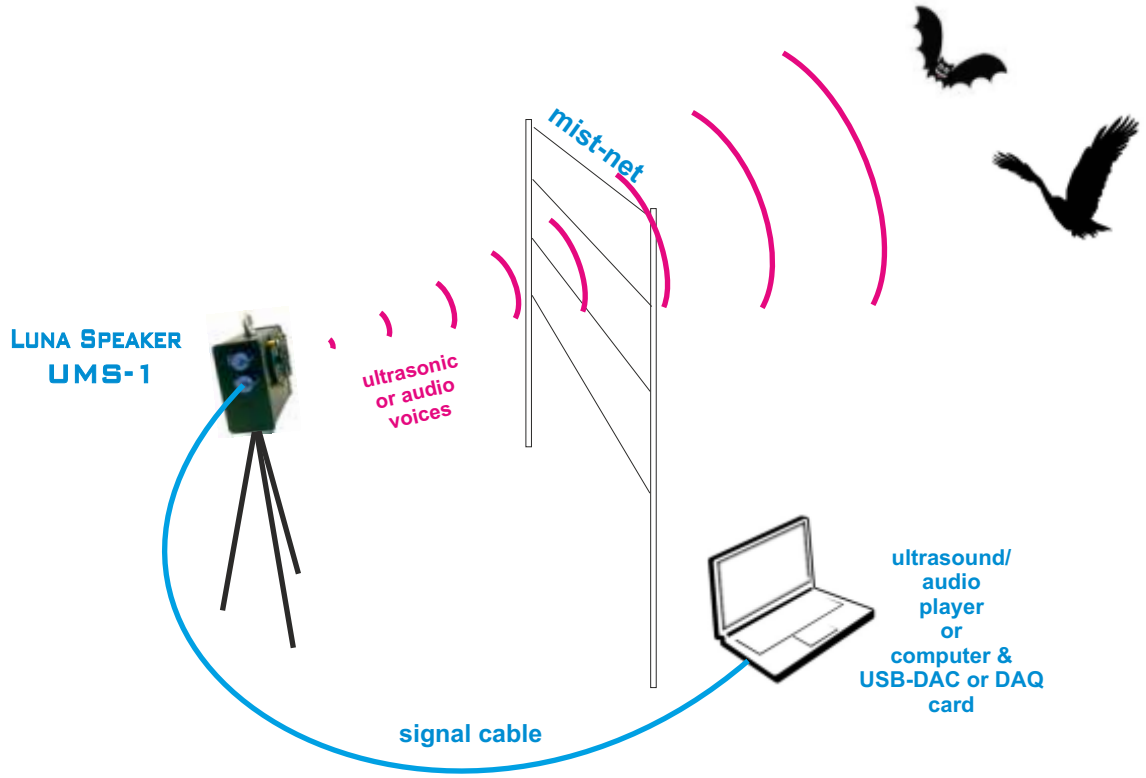
Very simple operation involves only:
- connecting the source via signal cable,
- providing supply power,
- enabling the device by pushing one push-button.

Sometimes some additional volume level correction is needed by pushing one of the **VOLUME** (-/+) push-buttons.

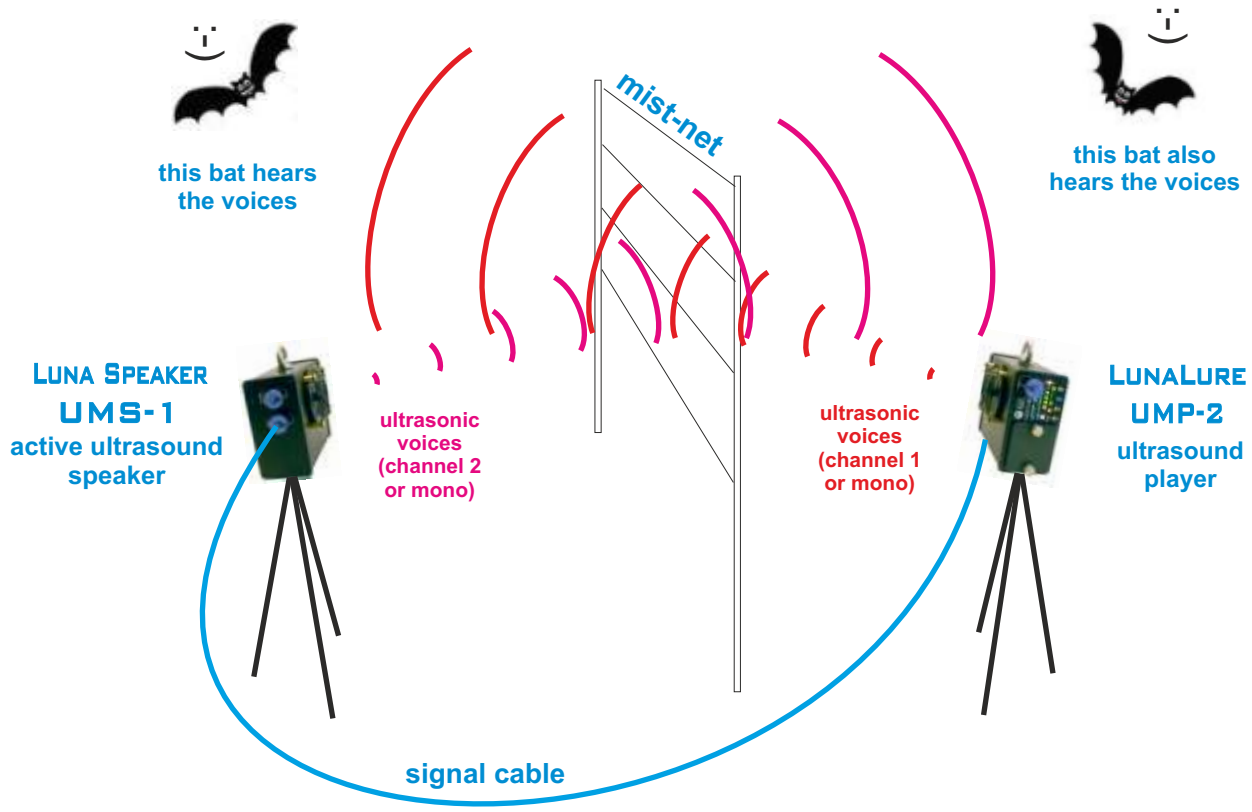
It is also possible to order a device with a modified behavior after connecting the power supply so that it automatically turns on without the need to start up with the POWER ON button.

1.1. Modes of field operation

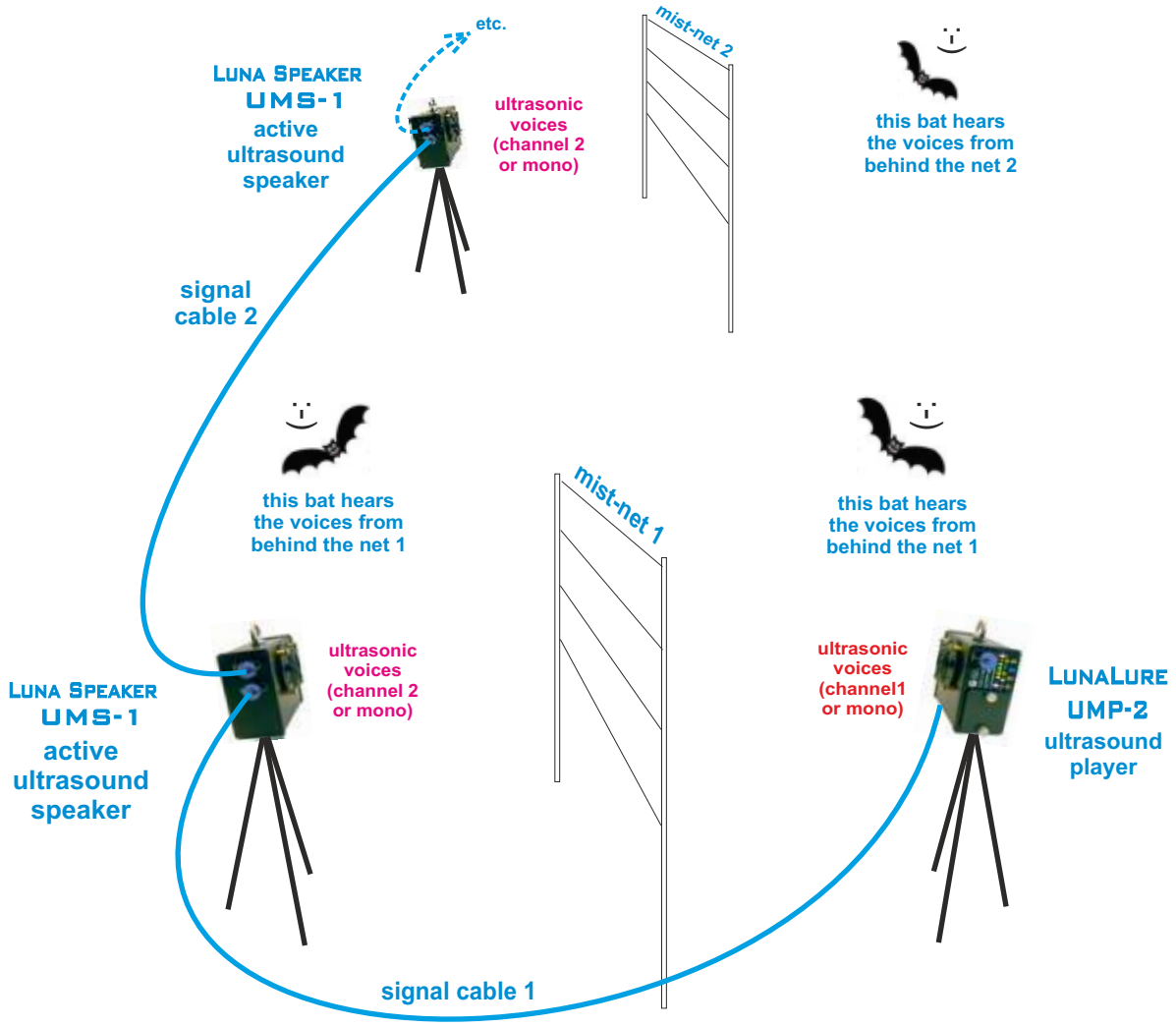
a) as a single audio or ultrasound active speaker
(it needs external player or other signal source):



b) as an additional (second) audio or ultrasound active speaker connected to remote **LunaLure UMP-1** or **LunaLure UMP-2** device:



c) as a third (or another) audio or ultrasound active speaker cascaded to other remote **Luna Speaker UMS-1** device:



2. Preparing for work

2.1. Powering the device

The device can be powered in two ways:
- from a pack of 8 AA size batteries (or accumulators) placed in a plastic basket with a battery connector;
- from an external source (battery, AC adapter, cigarette lighter socket) via an external power outlet and the corresponding cable available in the accessory kit or sold separately.

The current supply voltage range is about 9-15V, but due to the built-in converter the current consumption increases as the supply voltage drops. This applies both to internal and external power supply.
Switching power from external to internal occurs automatically when the external voltage is disconnected or when the external voltage drops below the internal supply voltage.
Device is protected against improper polarity of supply voltage. Incorrect polarity

of the supply voltage will not damage the unit, but the unit will not start up until it is properly connected.
To connect an external power supply unscrew the blue protective cap that covers the external power connector on the right / control panel (connector marked as PWR). Then connect the power supply cable (AC adapter or other dedicated power cable) to the PWR socket. The power cord plug (and the other cables) can only fit in one position. The white dots on the connectors should be pointing towards the top of the device. The power plug fits only into the external power socket, as is with the LINE IN and LINE OUT connectors.
When internal and/or external power is connected - press the ⏻ button briefly to power on the device. After powering up the LEDBAR will show the battery voltage level for ~3 sec, so you can quickly determine the state of battery voltage.
If the LEDBAR shows only 1 LED (or none) - the batteries needs to be replaced.

2.2. Battery replacement.
1) Unscrew 2 screws securing the battery compartment door.
2) Use the handle (short cord with a knot) to slide out the battery cartridge.
3) Place 8 pieces of AA size cells (primary or rechargeable batteries) in the cartridge and keep the polarity as marked inside each basket of battery cartridge (you can even disconnect the battery cartridge from the device by pulling the plastic connector casing on the back of the cartridge).
4) Carefully place the cartridge back inside the battery compartment, keeping in mind that the battery basket connector should be closer to the speaker/front wall and that the power cords are not cut between the cartridge and the side walls of the battery compartment.
5) Hide the handle (cord with a knot) inside the battery compartment opening.
6) Screw 2 screws fixing the battery compartment door.

NOTE: If the device is to be left unused for a long time - it is recommended to remove the battery from the battery compartment. This will prevent possible spillage or corrosion of the battery contacts and, in the case of accumulators, from being over-discharged due to the minimal (but still existing) current that powers the device even during shutdown ("sleep" mode) with minimized current consumption (the order of single microampers).

2.3. Mounting
The **Luna Speaker UMS-1** can be mounted on a photo tripod with a "small/amateur photo thread" (1/4" UNC-20 thread) by screwing the head or tripod adapter to a tripod socket located on the bottom wall of the enclosure or hanging it with the steel eyelet mount on the top wall of the housing.

3. Working with the speaker
3.1. Connecting to the source.
Remove (unscrew) the protective cap from **LINE IN** connector on a left panel and connect the proper cable connector to it (3-pin female connector). Connect the other end of signal cable to the **LINE OUTPUT** connector in the source of signal

*NOTE: Signal cable provided with **Luna Speaker UMS-1** is designed to connect the*

LunaLure UMP-1/UMP-2 *players. However, it allows you to output the signal to another active speaker. Provided cable is different than input cable for LunaLure, although it uses the same input plug. If needed - a dedicated input signal cable for connecting* ***Luna Speaker UMS-1*** *to other devices can be made (contact with Manufacturer).*

3.2. Volume regulation

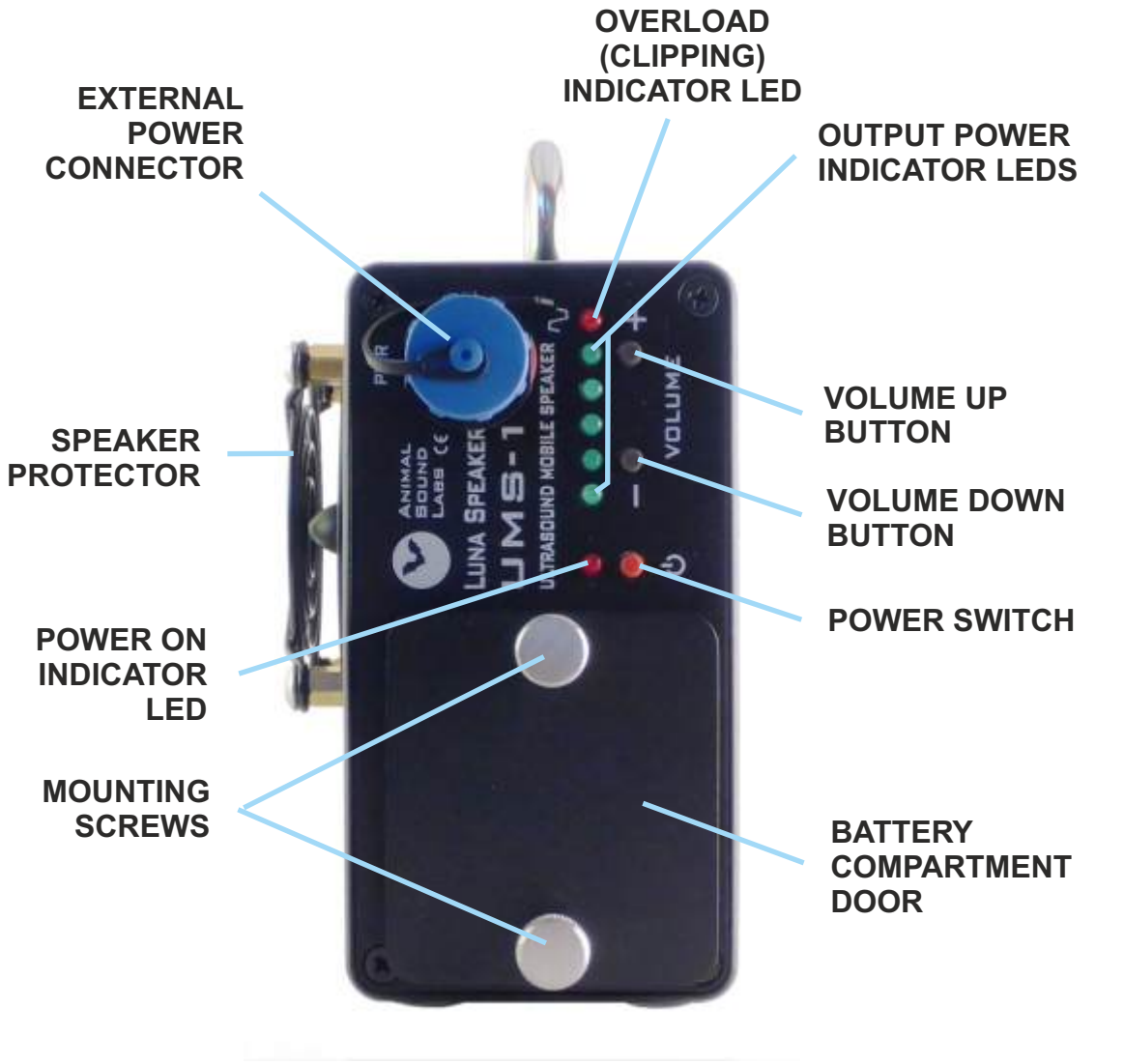
You can adjust the playback volume using the **VOLUME -/+** buttons in 32 steps. The last **CLIP** LED lights up **red** indicating that the amplifier is overdriven and that nonlinear distortions may increase. Then reduce the volume of the playback signal with the volume control (**VOLUME -**) button until the overdrive disappears.

3.3. Reading the battery status

After powering up the device the volume led's will light up for ca. 3 seconds according to the current voltage of the battery/batteries. There is a small difference in the rechargeable and non-rechargeable batteries because of cell voltage difference (1.2V/cell vs. 1.5V/cell) so the new/fresh primary(non-rechargeable) batteries should have higher voltage than freshly charged rechargeables.
For fully charged rechargeables ~4-5 LEDs should be visible, for fresh non-rechargeables ~5 LEDs should be visible. If there is only one diode visible after powering up the device - there is very little power in the batteries and it's best to replace the batteries with fresh/recharged. If only 1 LED (or 2 for a start and then 1 LED) lights up - batteries are also discharged, but they are on the edge of threshold of starting up the device. There is some histeresis loop added in the battery level sensing, so the starting voltage is higher than disabling voltage. When supply voltage is higher than ~8.1V internal dc converter starts up, and when voltage drops down to ~7.1V it will shut down the dc converter to avoid some unexpected behaviour caused by voltage regeneration process in batteries. This process is hard to be fully controlled and it's best to always replace the batteries when one of the situation occurs:
- only 1 LED (or for short period 2 LEDs and then 1 LED) are lighten up at start;
- only 1 green LED (or none on the LED bar) and the red CLIP LED are lighten up;
- when the red CLIP LED is constantly on and the distortion during operation starts to be very loud and audible with the human ear (except when the input signal is too high and the amplifier is simply overdriven).

4. TECHNICAL SPECIFICATION

Reproduced frequency band (+/-6dB) ……......................................1 kHz - 140 kHz
Beam angle (@20kHz -3dB) ....……........…...............….....…........… ~40 degrees
Signal to Noise ratio ……………………..…… ~85 dBA (+/-2dB)
Maximal output power …..…........…………..... 12 W
Standby current (disable state) .... <10 uA
Line output level (@ 0dB F.S., digipot at -6dB = default position) ….........…. 1,7 Vrms
Internal power supply ..……….. 8 * AA/R6 cells
External power supply …......…………………….....…......................... 9-15V (3A min.)
Battery operating time (at 2W effective mean/avg. output power) .... > 12 h
Tripod mount .... female thread for std. photo tripod (1/4" UNC, 20tpi)
External dimensions (without eyelet) ………... 155x105x67 mm
Steel eyelet diameter .... 28 mm
Weight (with 8 * AA cells) …………..........…....…..............…....…........…..… ~750 g


OVERLOAD (CLIPPING) INDICATOR LED
EXTERNAL POWER CONNECTOR
OUTPUT POWER INDICATOR LEDS
VOLUME UP BUTTON
SPEAKER PROTECTOR
VOLUME DOWN BUTTON
POWER SWITCH
POWER ON INDICATOR LED
MOUNTING SCREWS
BATTERY COMPARTMENT DOOR
STEEL EYELET
LINE OUTPUT CONNECTOR
LINE INPUT CONNECTOR
LUNA SPEAKER
ULTRASOUND MOBILE SPEAKER
VOLUME