MDS Series
Wireless Radio
Loudspeakers
User Manual

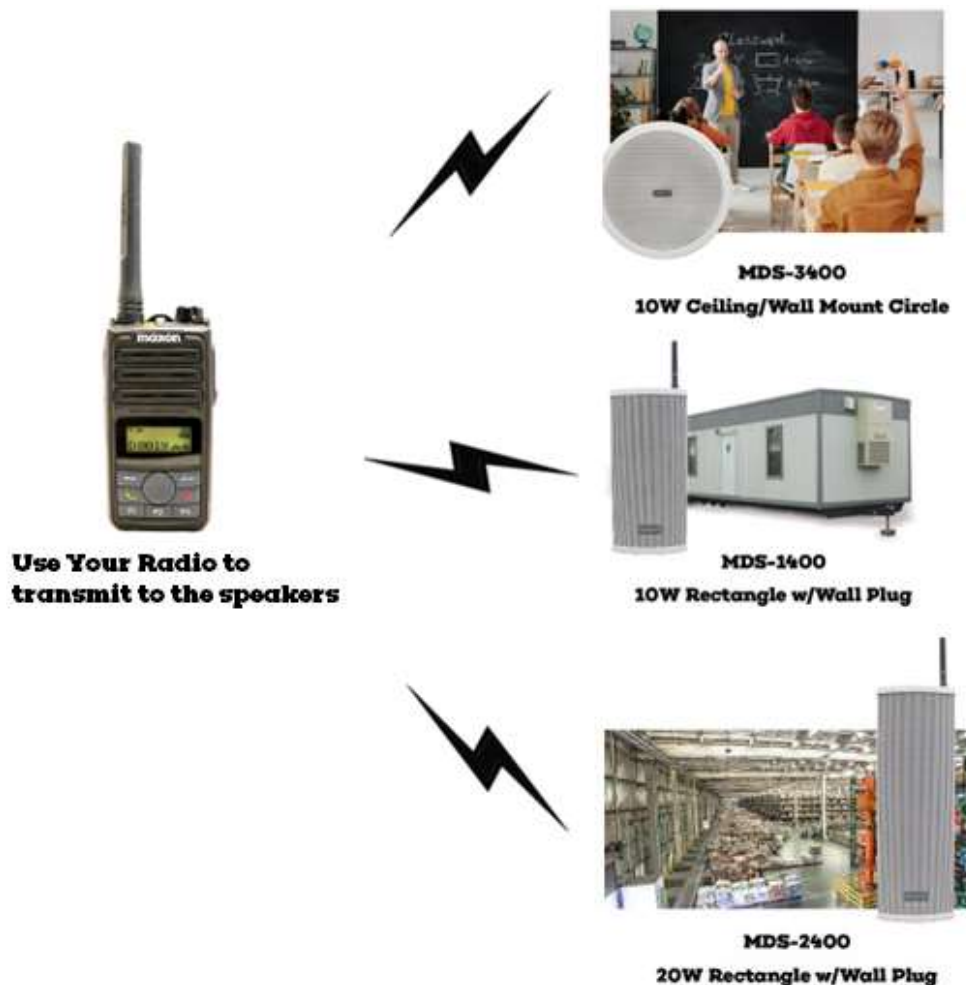**maxon**®
MAKE IT YOUR BUSINESS

1. What are the MDS-1400/2100/2400/3400 Series Loudspeakers?

MDS-1400/2400/3400 are wireless, programmable, receive-only radio loudspeakers that can be used with any Analog or DMR Digital (DMR Tier2 TDMA) portable or mobile radio programmed in the UHF band (400-470MHz) for remote broadcasting & announcements. System will allow a user with a portable radio within range to transmit audio from their radio to one speaker, a select number of speakers, or all speakers within a building/area.

The loudspeaker system consists of the speaker and a Bluetooth USB module for your PC that is used to program the speaker. The MDS Series uses a plug-in power supply that converts the AC voltage to 12VDC to power the speakers. MDS-1400/2100/2400 versions can be either wall-mounted or stood on a book shelf. The MDS-3400 is a circular speaker that is hard mounted into a wall or ceiling.

Use wherever wireless broadcasting or announcement loudspeakers are needed but where it may be hard to install wiring for a PA system: Schools, Factories, Bus/Train Terminals, Shopping Centers, Large Stores, Parking Lots, Golf Courses, Amusement Parks, Warehouse & Distribution Centers, and Public Address Alerting. The plug and play design means there is no installation of pulling wires through walls thus reducing costs and saving time.

Figure (1-1) shows basic use of the MDS loudspeaker with a portable radio.

Use Your Radio to transmit to the speakers

MDS-3400
10W Ceiling/Wall Mount Circle

MDS-1400
10W Rectangle w/Wall Plug

MDS-2400
20W Rectangle w/Wall Plug

2. Product Photos

MDS-1400 (10W)	MDS-2400/2100 (20W)	MDS-3400 (10W)

ID:08200483

ID# on Serial Number label is the speaker's **OWN ID**

3. Product Specs & Features

- Frequency Range is SW Programmable
  - MDS-1400/2400/3400: 400~470MHz
  - MDS-2100: 150-170MHz
- Channel Spacing: 12.5KHz
- Frequency Stability: ±1.0ppm (-30 ~ +60℃)
- Digital Vocoder: AMBE++
- Digital Protocol: ETSI TS 102 361

- Receiver Specifications
  - Sensitivity: 0.22uV BER 3%
  - Inter-modulation: 65dB
  - Spurious Rejection: -36dBm (< 1GHz) -30dBm (> 1GHz)

- Audio output

  - MDS-1400: 10W
  - MDS-2400/2100: 20W
  - MDS-3400 (Circle): 10W

- Dimensions

  - MDS-1400: 126(W) x 133(D) x 266(H)㎜
  - MDS-2100/2400: 126(W) x 133(D) x 376(H)㎜
  - MDS-3400: Ø227×100(D)mm

- Main features

  - Works with any DMR Tier II Digital or Analog Radio
    - MDS-1400/2400/3400 are in UHF band 400-470MHz
    - MDS-2100 is in VHF band 150-174MHz
  - Unlimited # of Loudspeakers & Portable Radios can be used together
  - Single Channel *(stores 512 Channels, 32 Channels per Zone)*
  - Programmable DMR / Analog / Mixed Mode Per Channel
  - Programmable 3-5 Channel Scan
  - Private Call, Group Call *(to use only specific loudspeakers),* All Call *(All Speakers)* with DMR radios
  - CTCSS/DCS can be used in Analog mode to access specific speakers
  - Broadcast Radio Alerts from Portable Radios for Emergencies
  - Program Speaker, Settings, & Upgrade firmware using Bluetooth Dongle
  - Rechargeable Backup Battery (5-Hr Broadcasting, 9-Hr Standby)
  - Portable w/Wall Plug (AC110V) or Wall/Ceiling-mount versions available
  - Remote volume control using MDP-6424/6124/7424/7124 Portable Radio
  - UHF/VHF "rubber duck" antenna supplied w/speaker set-up

4. Operation

4.1 Power ON

Operation is as easy as plugging in the loudspeaker. Speaker will turn on automatically about 30 seconds AFTER it is plugged into your power source (AC110V), at which point a bell chime will sound as the speaker has powered on and entered "Stand-by Mode". The switch or button on the bottom of the MDS-1400/2100/2400 rectangle or side of the MDS-3400 circle speaker is only used to turn on/off the back-up battery. It is not a "Power" switch. Leave this button/switch in the "ON" *position (Button LED will be lit)* so that the battery charges during use unless you need to turn off the battery for transport. Each speaker will stay on & be ready to receive until they are unplugged or the backup battery is drained.

4.2 Volume Control

Volume for the speaker is adjusted in either of two ways. One by the speaker's PC programmer and Bluetooth Dongle. The second is by an MDP-6424/6124/7424/7124 portable radio with the MDS functions enabled. *(Contact your local Maxon dealer for programming & additional information)*

4.3 How it works

Each MDS Series loudspeaker contains a UHF or VHF band "Receive-only" radio. Your two-way radios and the MDS speaker need to be programmed to be on the same UHF or VHF band radio frequency **before using**. *(Color Code will also be needed for DMR use, contact your local Maxon dealer for programming).* Once both the portable radio and the speaker are programmed, the user transmits audio to the speaker by talking clearly and loudly through the portable radio *(press and hold PTT button on the portable radio while talking).* Audio will broadcast through the wireless speaker as the portable radio transmits to the speaker and the sound will turn off when the user stops transmitting *(release PTT button to stop transmitting).*

Figure 4-1) Visual Diagram of General Radio to Loudspeaker Use:

MDS-3400
10W Ceiling/Wall Mount Circle

MDS-1400
10W Rectangle w/Wall Plug

MDS-2400
20W Rectangle w/Wall Plug

Use your portable radio to make announcements through the speakers

MDS-1400
10W Rectangle w/Wall Plug
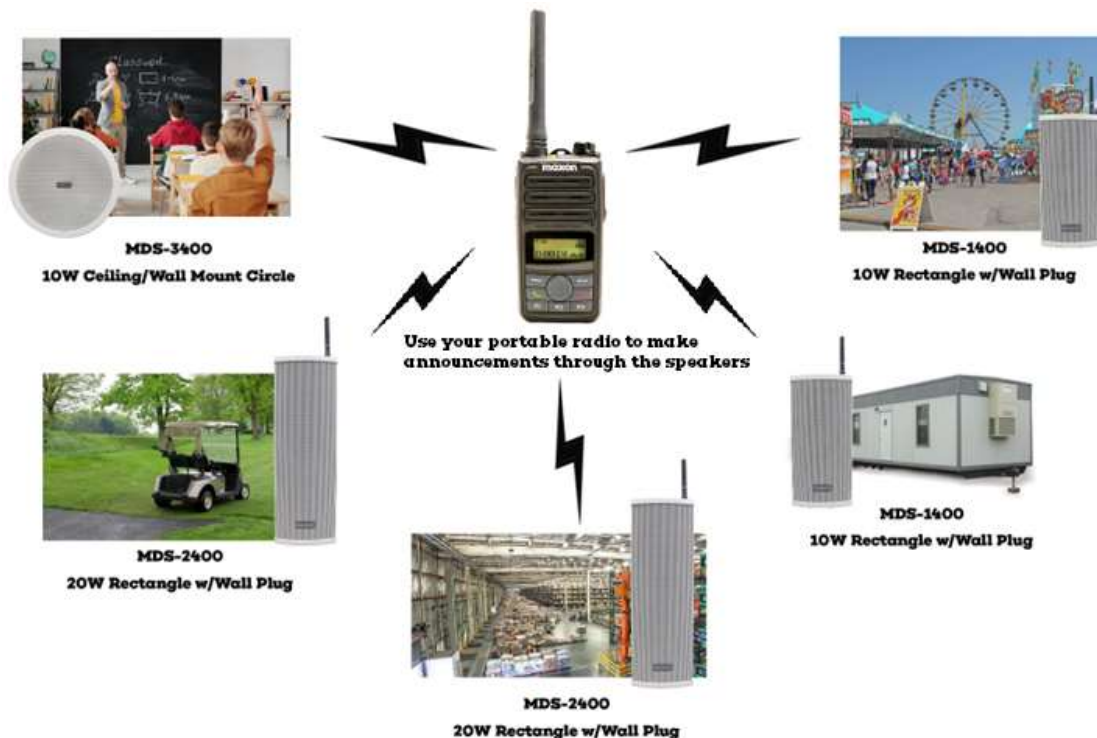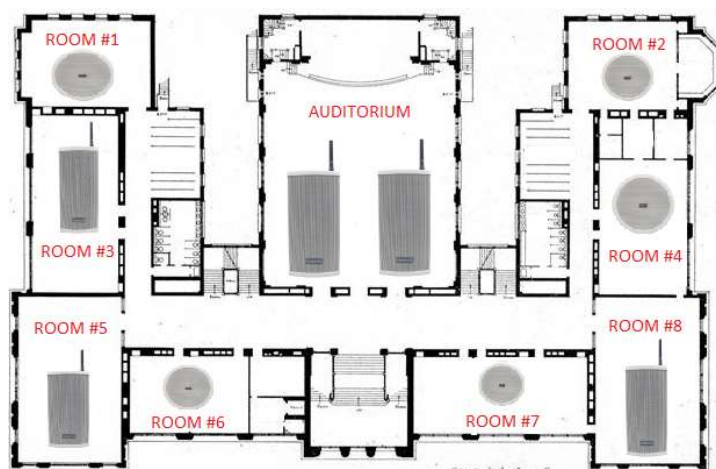
MDS-2400
20W Rectangle w/Wall Plug

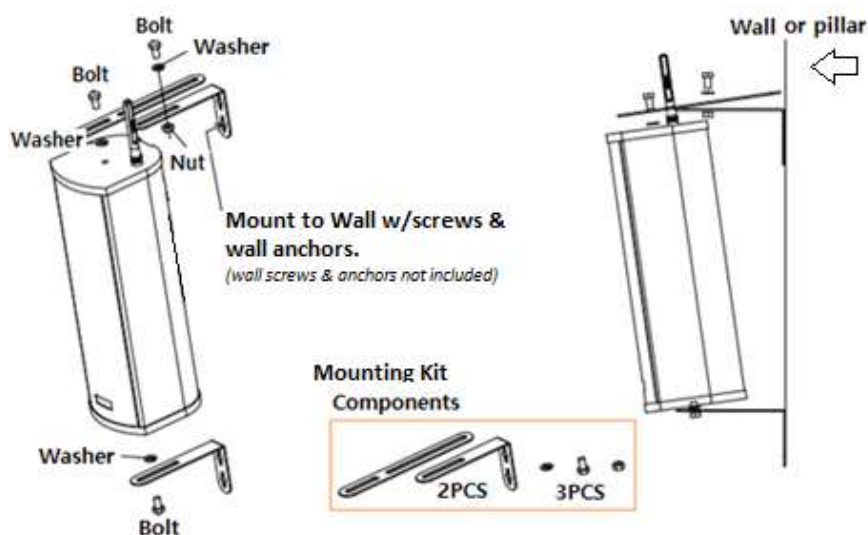Figure 4-2) Visual Diagram of Speaker use within a building:

When using in DMR Digital, each loudspeaker has a unique ID (OWN ID) that is used to identify each speaker. It allows the portable radio to select that specific speaker for volume control, or to broadcast to that specific speaker only. For a visual example, using the figure above you could program your portable DMR radio to speak to all the rooms with a speaker at once, or just a few speakers at a time *(Program your portable radio to broadcast only to Room #6 & #2).*

For Analog radio set-up, you will need to program CTCSS/DCS codes along with your radio frequency in specific speakers for privacy and also to differentiate between speakers when transmitting.

**The speaker should be programmed and tested with a portable radio before installation. *(Contact your local Maxon dealer for programming).* Turn off power & battery to any additional speaker you are not programming so that the Bluetooth Dongle only picks up the speaker you intend to program.

5. Install MDS-2000 & MDS-1400 wireless speakers onto wall brackets:

***UHF/VHF "rubber duck" antenna shown in image is included with speaker setup.
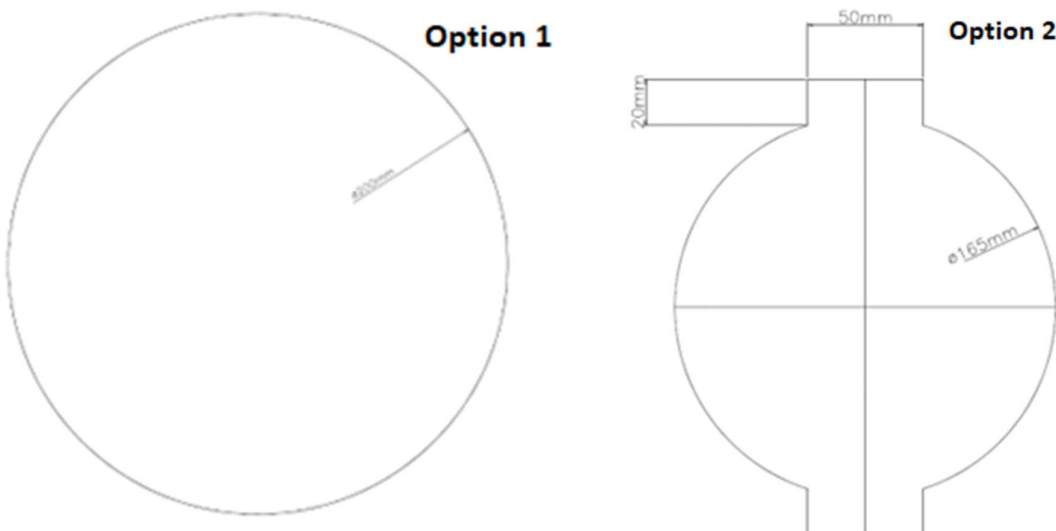
Figure 5-1) mount MDS-2000/1400 to a wall

- Gather Tools:
  - o Loudspeaker
  - o Mounting Kit *(2 brackets & position sliders, 3 bolts, 3 nuts, & 3 washers included to attach speaker to bracket)*
  - o Wall Screws *(**wall screws not included with kit.** Head of screw should fit eye of wall bracket)*
  - o Protective / safety goggles
  - o Ladder
  - o Drill (to drill holes for mounting bracket)
  - o Adjustable wrench and socket wrench

1. Before installing the wall mount brackets for your speaker, make sure you can access your power source with the wall plug and that there is enough room to attach the antenna to the top of the speaker. Although your speaker can handle rain and extreme weather, we recommend placing speaker under an awning if mounting outside. We also recommend programming the speaker before installation.
2. Mark pilot holes for mounting bracket. *Mounting screws for wall are not included with speaker.*
3. Drill holes for the mounting bracket & install brackets
4. If you want speaker to be mounted at an angle, bend brackets for positioning before completely tightening mount & attaching speaker.
5. Attach & screw speaker into mounted brackets. Position & tighten with wrenches.
6. Power your speaker on and plug in the power cord. Power-on chime will start within a few minutes when first turned on.
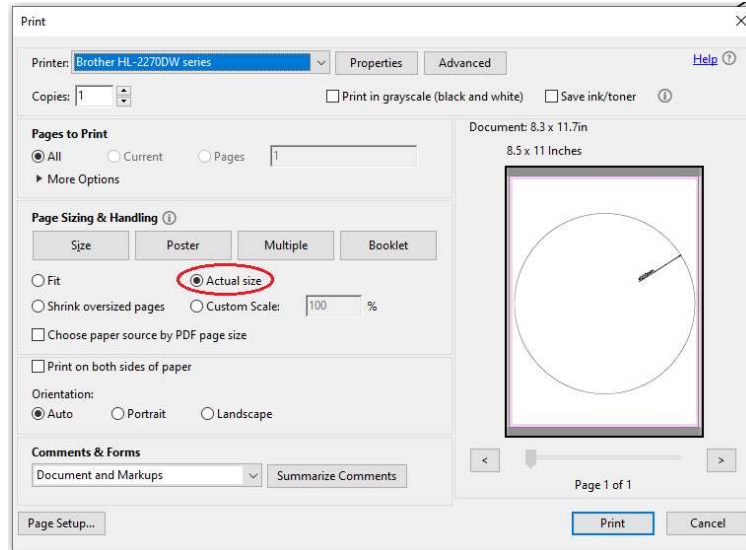

6. How to install the MDS-3400 wireless loudspeakers into the ceiling:

- It is recommended to have a professional electrician install the MDS-3400 speakers because of the electrical wiring and specific installation process in the ceiling.
- Gather Tools:

- o Loudspeaker kit
- o Protective / safety goggles
- o Ladder
- o Pencil & Cardboard Stencil of speaker to mark the location
- o Saw or box cutter to cut the ceiling
- o Drill (to drill a pilot hole for the saw)
- o Wire nuts for securing the 110V line cord
- o Phillips or Regular screwdriver
- o Wire cutter to strip the wires off.

- Use a pencil and our <u>cardboard stencil</u> of the speaker to mark the location where to cut**. MDS-3400 series speaker stencils are available free at www.maxonamerica.com**.
- Installation videos may also be available. Check with your Maxon dealer.

1. Before installing the ceiling speaker, choose the best location for your audio speaker by checking the topside of your ceiling. It may be necessary to center the speaker between the joists and remove the insulation. If the install is being done with access to the attic (the area above the speaker), there are 2 stencil types available for making the hole. **Option #1** is used when there is no direct access to the attic. **Option #2** is when the speaker can be mounted directly from the topside. Option #2 will have a more stable speaker mount.
2. When you have selected the desired stencil, cut out the center of the stencil and trace this onto the ceiling or ceiling tile.
3. Survey the area where the wire runs and plan out the position for the speaker. If there is no outlet to plug the power supply into, find the nearest junction box. **Make sure the power has been shut off by the appropriate breaker.** The plug on the 110V cord will need to be cut off and the wires stripped. Use wire nuts to secure the connection. If you are not familiar with this process refer the work to a qualified electrician.
4. Place the ladder to reach the desired location of the speaker. If the ceiling is made of ceiling tiles, it may be best to remove the tile for easy cutting. In this instance use stencil option #2.

5. Mark the area on the tile using the stencil of the speaker. If you are printing the stencil out, make sure you select "**actual size**".

6. Use a saw or box cutter to make a hole in the tile going all the way around the circle. The hole will be big enough to put the speaker through sideways without the grill.

7. Keep speaker grill hooks attached to speaker base, but detach grill.

8. Insert the speaker (without the grill) into the ceiling-hole of the tile and place it in the appropriate position. At this time, it may be necessary to plug the 12V line into the speaker. Also flip the switch on the speaker to the "ON" position. This switch turns on the back-up battery.

9. Adjust the position of the speaker by balancing the left and right sides of the hole.

10. Grasp and pull out each spring hook on the left and right sides of the speaker and hook them into the connection loops of the grill one at a time. Be careful not to damage the ceiling or pull the speaker through the hole.

11. Carefully adjust the final position of the grill.

12. Turn back on the power at breaker to provide power to the speaker.

13. Test the operation. Since programming is done wirelessly, it is not necessary to remove the speaker from the ceiling. Refer to the MDS Programming Guide or contact your Maxon dealer for more information.

7. Safety Notes

Please read the following recommendations for safe and effective use of the Radio.

WARNING	• Please do not remove or damage antenna, or use a damaged antenna. It affects the radio receiver's performance.
Caution	• Use only AC110V power. • If the power is unstable, noise may be generated in the wireless speaker. • Be careful when using the speaker in a place where computers or other electronic devices are being used because the strong electronic waves from the Radio can affect this equipment.
WARNING	• Please do not disassemble or modify the wireless speaker. It may damage or otherwise affect the product.
Caution	• Please do not damage or strike the speaker with hard impact. • Please avoid direct sunlight or place with high humidity.

Warranty Card

Thank you for purchasing Wireless Maxon Digital Speaker.

1. This product has passed strict quality control and testing procedures.

2. Warranty is three years from original date of purchase.
• Failure of the product under normal operating conditions, during the warranty period may be repaired by a distributor, the head office, or service center free of charge.

3. For the following cases, service fees will be charged.
• When repair occurs after the warranty period has passed.
• When the product is damaged used to user's mishandling, abuse of improper operation.
• When the product is damaged due to fire, pollution, earth quakes, and any other natural or unnatural conditions, accidents, etc.
• When defect caused by not following the instructions or precautions described in the user manual.
• When an improper power source is used.
• When the product is damaged due to user's modification, attempted repair or otherwise access to sealed/non-user serviceable items.

4. Personal information for wireless digital speaker

Model No	☐ MDS-1400, ☐ MDS-2100/2400, ☐ MDS-3400	
Serial No		
Purchase date		
Purchaser	Name	
	Address	

※ Complete the chart above after purchase.

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