E.A.R.S.

Item #1

Model #1

USE AND CARE MANUAL

Questions, problems, not working properly?

Check here!

Read This Manual Before Operating the Emergency Recognition and Alert System

Please read this entire manual carefully before installing, operating, or maintaining the system. This manual contains important instructions, safety precautions, maintenance guidelines, and troubleshooting information needed to use the device properly.

Failure to follow the instructions in this manual may result in improper operation, reduced system performance, damage to the device, or unsafe use.

This manual should be kept in a safe and accessible location for future reference. All users should review the operating instructions before using the system for the first time.

Important

Before using the device:

- Check that the system is securely mounted. **Page 15**
- Verify that the LEDs and visual indicators are working correctly. **Page 9**
- Do not use the device if it appears damaged.
- Do not expose the device to water, or harsh chemicals.
- Follow the cleaning and maintenance instructions provided in this manual. **Page 18**
- **The device should be stored while not in use, away from sunlight and in a cool location. The system is sensitive to direct sunlight.**

TABLE OF CONTENTS

General View of Device **4**

User Interface **5**

Warnings **7**

Instructions **9**

Mounting Recommendations **15**

Maintenance **18**

1. General View of Device

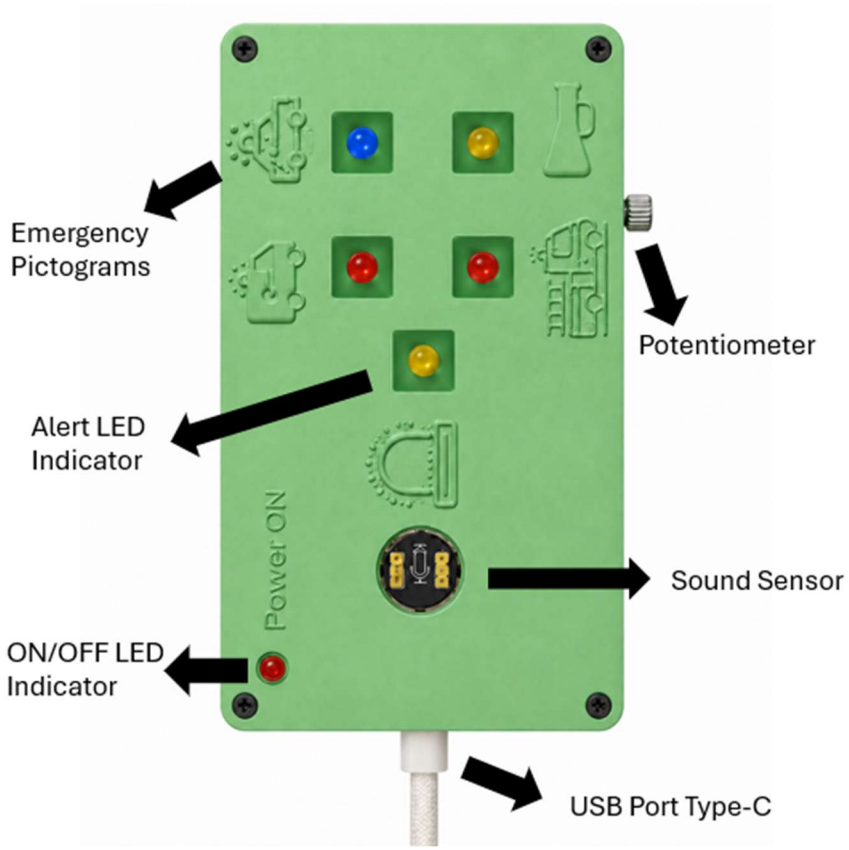

Figure 1. Front View of Device

General Description

The E.A.R.S. (Emergency Alert Recognition System) is a device that detects important emergency sounds and converts them into a visual alert. The purpose of this system is to assist deaf or hard-of-hearing users through an easy and recognizable light signal.

2. USER INTERFACE

- Status Indicator: Shows if the system is ON/OFF (**Figure 1**)
- LED Alert Light: Activates when the system detects a sound above the programmed threshold. This light serves as the main visual notification for the user (**Figure 1**).
- Sound Sensor: Captures the sounds from the environment for the system to process **(Figure 1**)
- Power Port USB Type-C: Allows the system to be connected to a power source (**Figure 1**)
- Potentiometer: Used for sensitivity adjustment of the LED's intensity for the user's comfort (**Figure 1**). Additionally, turning it, all the way clockwise turns ON the system, and all the way counterclockwise turns the system OFF.
- Pictograms: There is a pictogram for each individual alert and a general alert one. (**Page 6, Figures 2-6**)

Pictograms

Figure 2. Police Car Pictogram, represented with the Blue LED

Figure 4. Car Horn Pictogram, represented with the Yellow LED

Figure 3. Ambulance Pictogram, represented with the Red LED

Figure 5. Fire Fighter Truck Pictogram, represented with the Red LED

Figure 6. General Alert Pictogram, represented with the Yellow LED

NOTICE

The **Yellow LED** is used for both Car Horn alert and General Alert, and the **Red LED** is used for the Fire Fighter Alert, the Ambulance Alert, and the Power Indicator. Users should rely on the corresponding pictogram, label, or operating context to distinguish between these functions.

3. ⚠ WARNINGS

⚠ General Warnings

- This device is a supplemental aid and does not replace the user's awareness of their surroundings
- Do not use this device as the only safety method
- Do not expose the device to water or excessive moisture, especially the exposed Sound Senser (**Figure 1**)
- Do not throw the device or subject it to strong impacts
- Do not disassemble the product while it is connected to a power source
- Keep the device out of reach of small children
- Store the device away from sunlight and in a cool place when not in use

⚠ Small Internal Parts Warning

- This product may contain small internal parts
- This is not a toy
- Small parts may present a choking hazard if swallowed

⚠ Electrical Warning

- Use only the recommended power source (USB Type-C)
- Do not use damaged cables
- Disconnect the device before cleaning

⚠ Installation Warning

- Use a compatible device mount (**Page 15**)
- Do not place the device in a location that blocks visibility or interferes with normal user activity

⚠ Performance Warning

- Very low-volume sounds or environmental interference may affect detection.

- The system may produce false alerts in very noisy environments

⚠ Protective Case Warning

- For day-to-day use, do not open the protective case, especially if the device is connected to power.
- Do not touch the internal electronics.
- Do not insert fingers or objects into the sound sensor
- Internal components should only be handled by the project designer or under instructor supervision.

4. INSTRUCTIONS

Mounting Device

- Place the device in a secure location inside and on the dash of the vehicle
- A **car phone holder** mount is the recommended mounting method for this system**. Additional information and more examples of different mounts are shown on Page 15.**
- Position the device where the LED indicators are clearly visible to the driver
- Do not place the device where it blocks the windshield, mirrors, dashboard controls, or airbags
- Make sure the sound sensor is not covered or obstructed

Figure 7. Potential Mounts for System

Connection to Power Supply

- A USB Cable Type-C is necessary for the system's operations
- Locate the USB power input on the device (**Figure 8**)
- Plug into USB Power Source
- Ensure the cable is firmly connected before operating the device

Figure 8. The red arrow points to the system's power input. USB Type-C

Verifying the System is ON

- After connecting the power cable or after fully rotating the Potentiometer clockwise (**Figure 11**), check the Red ON LED (**Figure 9**)
- If the Red ON LED is illuminated, the system is powered on.
- If the ON LED does not turn on, inspect the USB connection and power source.
- Reconnect the system, if necessary, until the ON LED is visible.

Figure 9. The red arrow points to the system's ON LED indicator. When ON, it will glow Red

Confirming the Device is Ready for Use

- Check that the device is securely mounted.
- Make sure all alert LEDs and pictograms are clearly visible.
- Confirm that the sound sensor is unobstructed to the surrounding environment.
- Verify that the system remains powered on before beginning use.

Understanding the Alerts and Pictograms

Examples of the pictograms can be found back on **Figures 2** through **Figure 6,** and a close-up of their positions are shown on **Figure 10**.

When the system detects a programmed sound, the corresponding LED indicator will illuminate.

- Blue LED with Police car pictogram: Police-related Alert
- Red LED with Ambulance pictogram: Ambulance-related Alert
- Red LED with Fire Truck pictogram: Firefighter-related Alert

- Yellow LED: Car horn alert or general alert: Car horn-related alert and a general alert that the system is picking up emergency related sounds

The user should identify each alert by observing both the LED color and the associated pictogram. Note that some LED colors are being repeated, the Yellow LED is being used for the General Alert (**Figure 6**) and the Car Horn Alert (**Figure 4**) and the Red LED is being used for the Ambulance Alert (**Figure 3**), Firefighter Alert (**Figure 5**), and the Power Indicator LED (**Figure 9**).

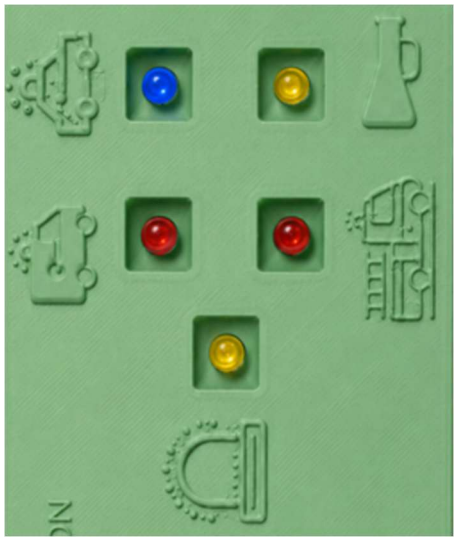

Figure 10. Close up on the device's Alert Pictograms

Adjusting LED Brightness

- Locate the potentiometer on the device (**Figure 11**).
- Turn the potentiometer clockwise to increase the brightness of the LED indicators. Rotating it fully clockwise turns the system ON. If the system is already on, keeping the potentiometer in this point will not affect the device.
- Turn the potentiometer counterclockwise to decrease the brightness of the LED indicators. Rotating it fully counterclockwise turns the system off. To turn the system back on, reconnect it to the power source or rotate the potentiometer fully clockwise.

- Adjust the brightness until the visual alerts can be clearly seen under the lighting conditions.

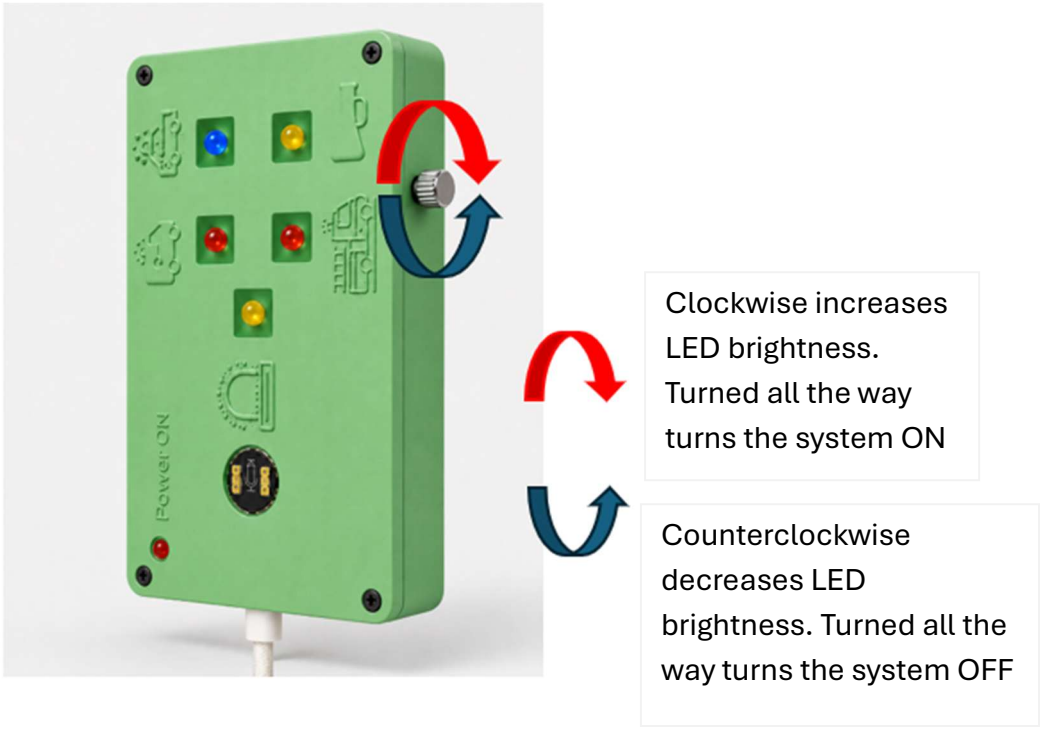

Figure 11. The curved arrows are on the system's Potentiometer. It is used for adjusting the LED's brightness and turns ON/OFF the system when rotated fully in the respective direction.

Normal Operation

- Keep the device connected to power during use.
- Allow the sound sensor to continuously monitor surrounding sounds.
- When an emergency or warning sound is detected, observe the corresponding LED indicator.
- Use the pictogram and LED color together to identify the type of alert (**Page 6**).
- Respond according to the surrounding situation.

If the Device does not respond as expected

- Check that the device is still connected to USB power.
- Confirm that the Red ON LED is still illuminated.
- Inspect the sensor area for obstructions.

- Verify that the device mount has not shifted position.
- Restart the system by disconnecting and reconnecting the USB cable if necessary.

Turning the Device OFF

- Disconnecting the system from the power source turns OFF the system. Additionally, rotating fully the Potentiometer (**Figure 11**) **counterclockwise** also turns OFF the system.
- Confirm that the Red ON LED turns off.
- Store the device safely if it is not used again immediately.

Figure 12. The red arrow points to the system's ON LED indicator. When OFF, it does not glow

5. MOUNTING RECOMMENDATIONS

The device should be mounted in a position where the user can easily see the LED indicators without interfering with safe vehicle operation. Examples of these mountings can be seen in **Figure 7** and more general examples on **Page 17**

Mounting Orientation

The device may be installed in either **vertical** or **horizontal** orientation according to the user's preference. Both orientations provide full functionality and do not affect the performance of the emergency alert system.

Recommended Mount

A **car phone holder mount** is the recommended mounting method for this prototype. This type of mount helps keep the device stable, visible, and easy to position inside the vehicle. The recommended mount for this system is the **RAM® Finger-Grip™ Universal GPS and Radio Holder, model RAM-HOL-UN4U (Figure 13)**. This mount is suitable because, when configured with the long arm side clamps, it can accommodate devices up to approximately **3.5 inches wide** and **1.6 inches deep**. Since the system is approximately **2.56 inches wide** and **1.57 inches thick**, the mount can hold the current casing dimensions.

Figure 13. RAM® Finger-Grip™ Universal GPS and Radio Holder model RAM-HOL-UN4U

Mounting Guidelines

- Mount the device in a location visible to the driver.
- Do not place the device where it blocks the road view, mirrors, dashboard controls, or airbags.
- Make sure the mount holds the device securely during vehicle movement.
- Position the device so the sound sensor remains exposed to the surrounding environment.
- Confirm that the LED indicators and pictograms are clearly visible after mounting.

Examples of Mounting

Figure 14.

Figure 15.

Figure 16.

Figure 17. Dashboard-mounted heads-up display (HUD) phone holder

NOTICE

An average smartphone measures approximately 145-160 mm × 70-80 mm × 7-9 mm, while the proposed system measures 120 mm × 65 mm × 40 mm. Although the system is thicker than a typical phone, its overall height and width are relatively comparable. For this reason, the phone mount should be capable of supporting a device thickness of up to 40 mm.

6. MAINTENANCE

General Maintenance

The device should be inspected regularly for dust buildup, or signs of wear. The user should verify that the LED alert indicators, sound sensor, and power connection are functioning properly before use.

The internal electronics are enclosed inside the protective housing and should not be tampered with during normal operation.

Cleaning the Device

The outer housing should be cleaned using a **soft dry cloth** or slightly **damp microfiber cloth**. Do not allow water or other liquids to enter the device. The sound sensor area (**Figure 18**) should be kept free of dust and debris to ensure accurate sound detection.

The recommended cleaning method is to gently wipe the outer case and sensor openings without applying excessive pressure.

Figure 18. The red arrow points to the system's Sound Sensor

Chemicals to Avoid

To prevent damage to the device housing and internal electronics, do **not** use harsh cleaning chemicals or solvents. Keep the device away from:

- Acetone
- Bleach
- Ammonia-based cleaners
- Alcohol in high concentrations
- Paint thinner
- Gasoline or petroleum-based solvents
- Abrasive cleaning powders or pads

These substances may damage the protective case, remove labels or pictograms, or affect the electronic components.

Periodic Inspection

The system should be inspected periodically to confirm that:

- The LED indicators are operating correctly
- The pictogram labels are visible and undamaged
- The sound sensor is clean
- The mounting system is secure
- The wiring is intact
- The protective case is not cracked or loose.

If any component appears damaged, loose, or nonfunctional, the device should not be used until it has been inspected by the project designer or instructor.