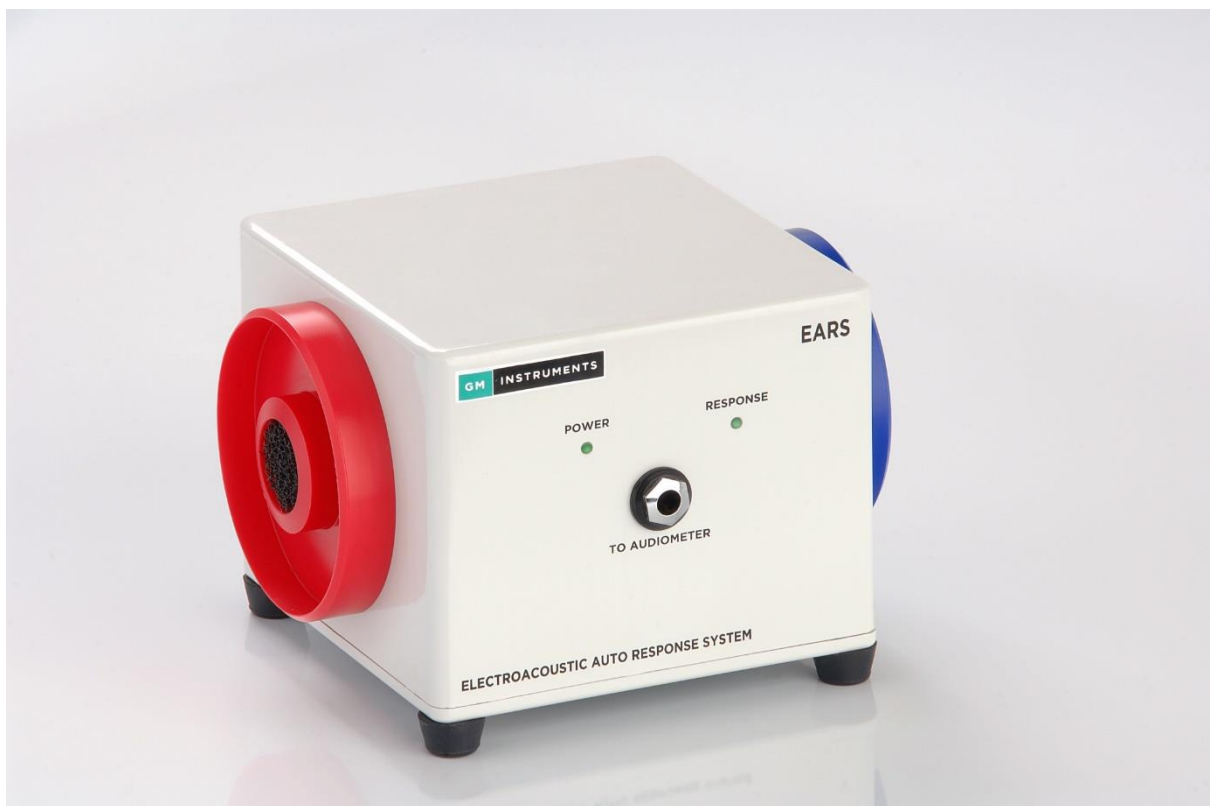


Electroacoustic Auto Response System

User Manual



Contents

1. Overview	3
1.1 Audiometer Test.....	3
1.2 Response Unit Test.....	3
2. Connecting the EARS	4
2.1 Connecting an Audiometer Test.....	4
2.2 Connecting a Response Unit Test.....	5
3. Using the EARS.....	5
3.1 Performing an Audiometer Test.....	5
3.2 Automatic Test.....	6
3.3 Manual Test.....	6
3.4 Results Assessment.....	6
3.5 Performing a Response Unit Test.....	6

1. Overview

The GM Instruments Electroacoustic Auto Response System (EARS) provides two test functions for an audiometer system:

1. A performance test of the acoustic output of an air conduction audiometer
2. A function test of the Response Button used with an audiometer

1.1 Audiometer Test

EARS is to be used to check the hearing level output of an audiometer before performing a hearing test to ensure it is working correctly and there are no hardware connection faults in the system, according to the routine checking regime outlined in clause 12 of ISO 8253-1:2010.



EARS may not be used as a calibration instrument, and results achieved using EARS do not negate the need for calibration. Audiometer calibration should always be performed by an appropriate individual with appropriate equipment at the specified time intervals outlined by the audiometer manufacturer.

EARS takes the place of a person during a hearing test and will provide an automatic response when the audiometer sound output reaches a certain hearing level.

A response is indicated by the Response LED flashing. EARS is designed to provide a response at 80dB for 1kHz, 2kHz, 3kHz, 4kHz, 6 kHz. Giving a sum of 400dB

EARS has the advantage over a person checking the performance in that it always responds at the same level for a given frequency and so can give an early indication of a possible audiometer, cable, headphone or connection problem.

1.2 Response Unit Test

EARS also provides a method for checking the operation of the Response Unit used with an audiometer to ensure it is working correctly.

2. Connecting the EARS Device

2.1 Connecting an Audiometer Test

What You Will Need:

- EARS Box
- USB cable (provided)
- Response Cable (provided)
- Audiometer and accessories
- Headphones, ideally with Audiocups



Ensure the headphones are the correct pair for the audiometer being tested

As shown above, the headphones are placed onto the moulds of the corresponding colour on the EARS box, making sure that the inner earphone fits straight inside of the mould. If the headphones are fitted with audiocups, ensure the outer padding is tight and flush against the sides of the box. Tilt the headphones so that the left and right headphone cable connectors are just off of the table surface and ensure the headband is set to the smallest size.

Using the cable provided, connect the socket labelled “TO AUDIOMETER” to the “AUDIOMETER RESPONSE” socket if using an ASRA, or the “Switch” socket if using an Osicus. This is in place of the usual patient Response Unit.

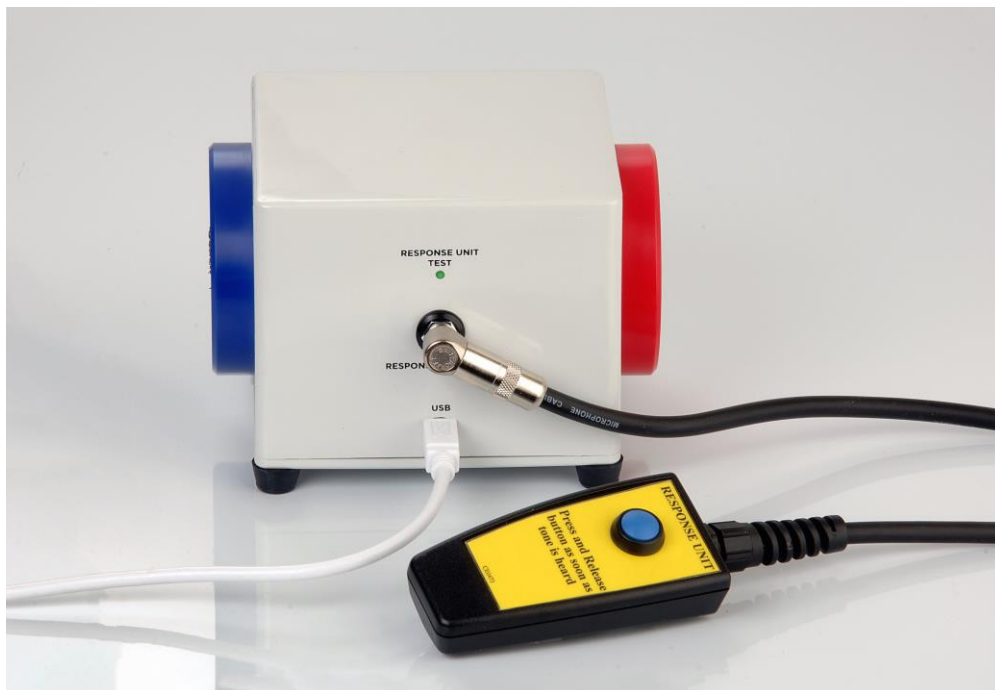
If using a booth, the “TO AUDIOMETER” socket should be connected to the patient response socket inside the booth.

Using the USB cable provided, connect EARS to your PC/laptop via the USB port on the rear of the device in order to power the unit. The power light should illuminate once the USB has been connected.

2.2 Connecting a Response Unit Test

For the Response Unit test, the Response Unit is connected into the “RESPONSE UNIT INPUT” jack socket on the rear of the box.

The Response Unit Test should not be performed whilst an automatic Audiometer Test is taking place as it may affect the test results.



3. Using the EARS Device

3.1 Performing an Audiometer Test

To use EARS to perform an audiometer test, set up your audiometer leaving out the response unit and then connect up the EARS system as shown above.



For best results the test should be done in a quiet environment to prevent unwanted effects on the test caused by background noise. Care should be taken to ensure that the surface the EARS box sits on is left untouched when the test is running as vibrations caused by knocks on the surface can be picked up by the microphones in EARS and could affect test results.

3.2 Automatic Test

An audiometer performance check can be performed by running an automatic test in the same way a patient would be tested. For ease of use and quickness this test method is recommended. It is advised to keep a record of each performance check for future reference by saving the test to your computer with an appropriate name.

3.3 Manual Test

To perform an audiometer performance check using a manual test:

- Present a tone at 1kHz on the left ear at 70db Hearing Level
- Increase the Hearing Level in 5dB increments until a response occurs (shown by the "RESPONSE" LED flashing)
- Repeat for 2kHz, 3kHz, 4kHz and 6kHz
- Repeat process for the right ear

It is recommended to keep a record of each performance check for future reference by saving the test to your computer with an appropriate name.

3.4 Results Assessment

The sum of the thresholds of 1kHz, 2kHz, 3kHz, 4kHz, 6kHz should be **400dB** ± 10dB for each ear.

A consistent threshold drop to 85dB or more across one or both ears indicates a connection problem somewhere in the audiometer system.

3.5 Performing a Response Unit Test

The Response Unit can simply be tested by plugging it into the Response Unit input on the rear of the EARS device and pushing the button. If the Response Unit Test LED turns on when the button is pressed, the Response Unit is fully functional.

MANUFACTURED BY:

G M INSTRUMENTS LTD,
Block 1 Annickbank Innovation Campus,
Annick Road,
Irvine
KA11 4LF
UK

TEL: +44 (0)1294 554664
EMAIL: enquiries@gm-instruments.com
Web Site: www.gm-instruments.com