# Acoustic Energy Meter
## Model RDL4 - AUS


## Features

Each unit is supplied complete with the following:

- Intelligent battery charger
- Charging rack/adaptor unit
- Handbook
- LED alarm level adjustment screwdriver.

## Applications

The Acoustic Energy Meter (AEM) is a hand-held, non-destructive testing instrument which can be used to measure the integrity of lined and unlined tunnel surfaces. It is powered by a rechargeable battery and is supplied complete with an intelligent charging rack unit, which plugs into the mains power supply. Applications to date include concrete segments and shotcrete tunnel linings and gypsum, coal and hard rock mine roofs.

The AEM comprises an integral geophone and readout unit, with optional external geophone. It measures reverberation decay rate when a structure is struck with a hammer or similar high inertia object.

- a detached, fractured or poorly backfilled lining or loose rock, vibrates for longer, giving a high readout number.
- intact rock or a well grouted lining gives a low number.
- using the Acoustic Energy Meter, a detailed tunnel surface condition survey can be completed rapidly.

Model RDL4 AUS is approved in Australia to Ex ia **I** **I**P65 (Ex 02. 3858X) for use in methane-air atmospheres. As well as an alphanumeric Liquid Crystal Display (LCD), the RDL4 AUS incorporates a Green, an Amber and a Red Light Emitting Diode (LED), one of which lights depending upon the pre-set alarm levels.

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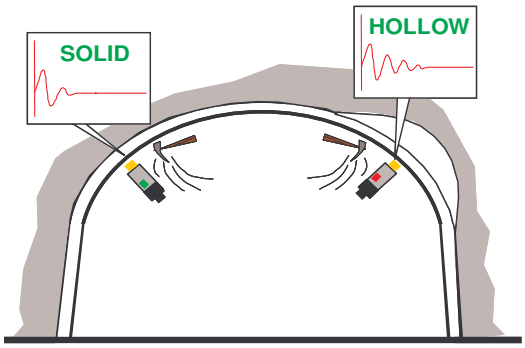
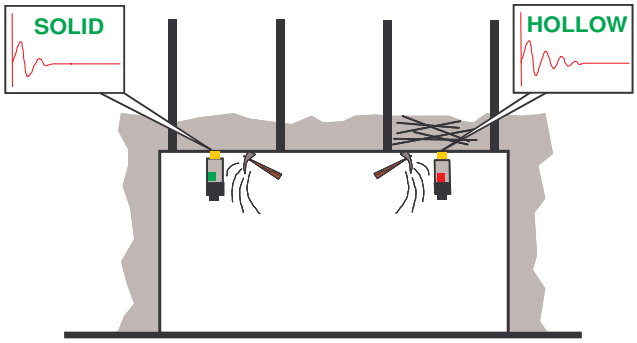
## Operating Principle

In practice the Acoustic Energy meter is simple to use. With the meter switched on, hold geophone against the suspect area with one hand and hit the tunnel surface (within 20 cm of the meter) with a hammer and note the reading or LED colour. Interpretation of meter's normalised readings is, by design, readily assimilated with local conditions. RMT with its extensive experience in rock mechanics can provide appropriate training and back-up to compliment this field




**Taking measurements**

Switch the instrument on and place the head of the geophone firmly against the rock or lining to be tested. An extension pole can be plugged to the base of the instrument when monitoring high roofs. Alternatively the optional external geophone can be plugged into the unit and this can be held against the rock or lining to be tested. Have a hammer or striker ready. When the white LED flashes hit the roof approximately 25 cm from the instrument contact point with a sharp blow. Dependent on roof condition one of the LED's will illuminate for a short period. At the same time a number representing the soundness of the immediate strata will be displayed and held until the next measurement or 'time-out' (about 14 sec) whichever is the shortest. Another reading can be taken as soon as the white LED resumes flashing. It is advisable to take three readings at each location.

**Logging the measurements**

Location identity must be unambiguous when making records of roof condition readings. Log the three LED colours or readings per location and highlight any that show red. Remember this logged data is of no value unless it is examined and acted upon accordingly.

**Adjustment of alarm level**

The alarm level (LED threshold) is user adjustable. The system is supplied with the amber/red threshold set at 100. The green/amber threshold is always 75% of the amber/red threshold (factory setting 75). To adjust the amber/red threshold, with the unit switched off, the small screwdriver supplied should be fully inserted through the small hole on the left hand side of the instrument. The instrument should then be switched on and, when the alarm level value is seen in the LCD window, rotate the screwdriver until the required setting is reached. If the adjustment is not completed within the given time, switch the instrument off and then on again.

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