

BridgeAlert-M™

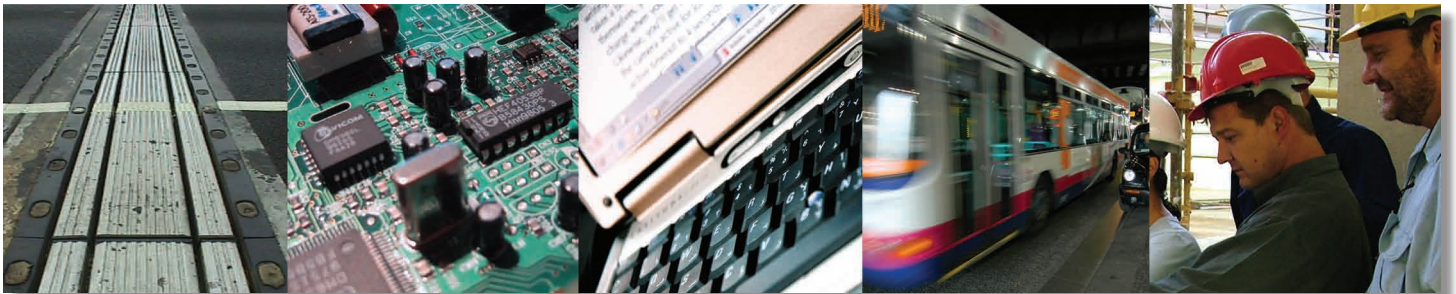
A Unique Bearing Loss Early Warning System for Bridge Structural Integrity Monitoring

The BridgeAlert-M™ Bearing Loss Early Warning System developed by SLR Heggies provides real-time monitoring of Modular Bridge Expansion Joints employed on bridges such as the well known ANZAC Bridge (Sydney, Australia). Expansion Joint Linear Bearing blocks can work loose in service, dislodge or become displaced. The loss and/or displacement of such bearings may result in damage to the bridge and can lead to accelerated fatigue of structural members. This has the potential to close transport arteries or cause major traffic disruptions while repairs are effected and/or accidents cleared.

Until the development of BridgeAlert-M™, visual inspection was the only way of checking Modular Bridge Expansion Joints. Visual inspection requires lane closures and often has to be done at night to minimise traffic disruption. The innovative BridgeAlert-M™ detects lost/displaced bearings by analysing the sound produced when the wheels of the passing traffic cross the joint. The detection algorithms have been fine-tuned to cope with widely varying traffic density and different vehicle types.

BridgeAlert-M™ is extremely cost effective as it:

- Eliminates the possibility of structural damage occurring and maximises fatigue life
- Gives prompt warning of impending problems so remedial action can be scheduled
- Dramatically reduces the possibility of litigation as the result of an accident to the general public
- Eliminates the need for lane closures and night inspections and associated risk to inspection personnel
- Has a pay-back period of less than two years, compared to standard bridge inspection alternatives



How Does BridgeAlert-M™ Work ?

A series of microphones is mounted under the bridge decking adjacent to a modular expansion joint where sounds emanating from the bearings are captured. Each microphone plugs into its own mounting or junction box to facilitate replacement. Each of these junction boxes is hard-wired back to the BridgeAlert-M™ Processing Unit (BMPU). Each channel runs through a high performance sound card (within the BMPU) where a Fast Fourier Analysis is performed to provide individual 1/3-octave band spectra. Special software developed by SLR Heggies is used to detect changes in the spectral power density of each channel as well as the overall signal level. These changes provide the indication that a bearing has become displaced or has dislodged.

Data from the BMPU is continuously fed to a radio modem which transmits the information to a secure database on the SLR Heggies (or Client) server. The data collected from each joint is analysed and displayed (real-time) to show performance over time. As soon as a fault is detected, an SMS message is sent to a nominated responsible person and an alarm raised. Early detection allows repairs to be scheduled with minimal disruption to traffic flow and at minimum cost.

In its standard configuration, the BridgeAlert-M™ Processing Unit and radio modem are mains powered. Solar power is an option. Batteries, Uninterruptible Power Supplies (UPSs), battery chargers and solar panels can be supplied to suit individual customer requirements.

BRIDGE SAFETY AND CONDITION MONITORING BRIDGEALERT-M™

Standard Configuration

BridgeAlert-M™ Processing Unit with software
ETM 9550 Radio Modem
Microphones C/W mounting/junction boxes (typically 4-6 mics)
System Cables
Antenna
Server Software

Physical Characteristics

Size: 480mm x 242mm x 195mm
Weight: 16Kg
Operating Temp. Range: -20C to +50C
Relative Humidity: 0 to 95% non-condensing
Environmental Protection: IP65
Mounting: 4 x M8
Mic Mount/Junction Box: 120mm x 60mm x 40mm

Server Software

SLR Heggies Proprietary MS Windows

Installation Accessories

Solar Panel Mounting Frame: For Sharp Solar Panel
Weatherproof Housing: Contact SLR Heggies

Specifications

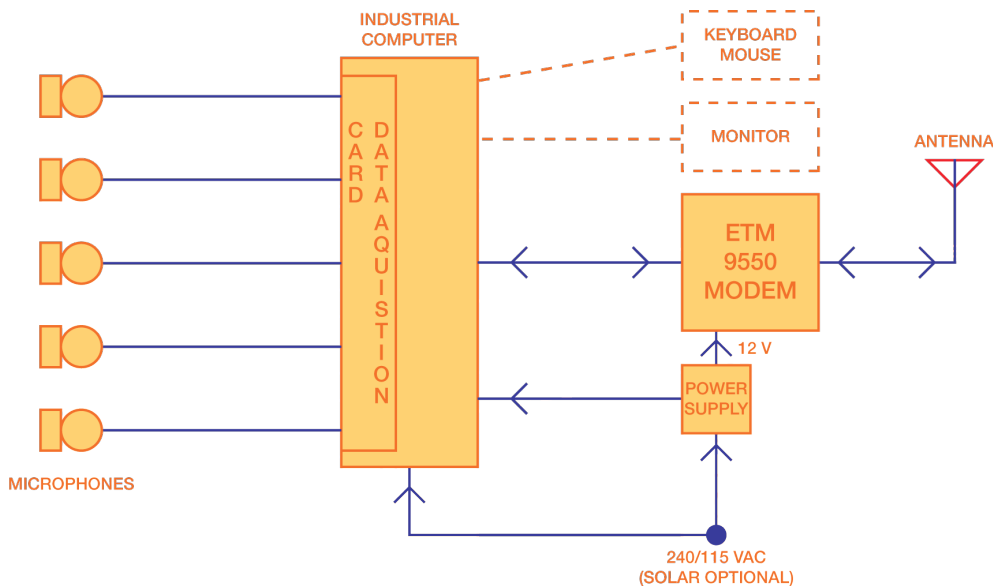
BridgeAlert-M™ Processing Unit
ETM 9550 Radio Modem
Fully sealed Industrial Computer for rugged conditions, and incorporating a 6 slot PCI/ISA passive backplane. Plug in industrial computer card with Pentium III or later CPU. The passive backplane provides easy maintenance and a simple upgrade path.

Power Supply Options

Mains Power: 240/115 VAC, 50 Hz – 60 Hz
Solar (Optional): Contact SLR Heggies
UPS (Optional): Contact SLR Heggies

Electrical

Inputs: 5 x Balanced Microphone
Nominal Input Level: 3mV/-48dBm
Microphone: Environmental type pre-terminated in connector backshell
Network Interface: GSM/GPRS (GPRS Class I0)
Alerts: SMS and/or GPRS (UDP or TCP)
Power Requirements: 12+/-1 VDC
Power Consumption: 1 W
Power Supply (Standard): 240/115 VAC to 12VDC



BridgeAlert-M™ Layout Diagram

RELATED SLR Heggies SERVICES

- Acoustics, Noise & Vibration
- Air Quality, Water Quality, Land Quality, HAZMAT Studies
- Real Time (Web-based) Environmental Monitoring
- Wind Engineering & CFD (Computational Fluid Dynamics)
- Finite Element Analysis & Solid Modelling
- Mechanical and Structural Dynamic Analysis
- Web & Video Media Services
- Community Liaison, Expert Testimony

Visit us at www.heggies.com or call **1 300 434 443** to find out more.

Heggies Pty Ltd is a member of the International SLR Group
www.slrconsulting.com