

BridgeAlert-F™

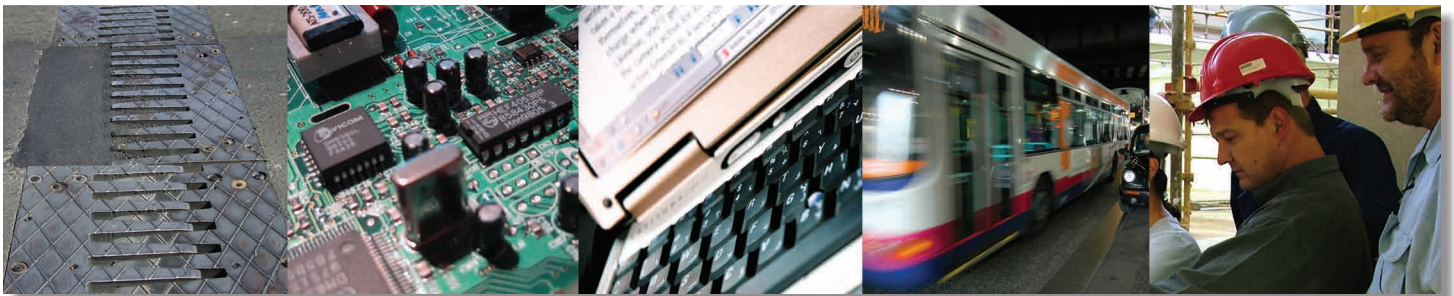
A Unique Early Warning System for Bridge Structural Integrity Monitoring

The BridgeAlert-F™ Bearing Loss Early Warning System developed by SLR Heggies provides real-time monitoring of the Finger Plate Expansion Joints used commonly in bridges and suspended roadways. Segments of finger joints often work loose in service and looseness and/or failure may result in structural damage to the bridge. Very loose or detached joint segments can also become a collision hazard for motorists and pose a real threat to human life. Such events have the potential to close transport arteries or cause major traffic disruptions.

Until the development of BridgeAlert-F™, visual inspection was the only way of checking Finger Plate Expansion Joints. Visual inspection requires lane closures and often has to be done at night to minimise traffic disruption. The innovative BridgeAlert-F™ detects loose/or damaged joint segments by analysing the sounds 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-F™ 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-F™ Work ?

A series of microphones is mounted under the bridge decking adjacent to a finger plate expansion joint where sounds emanating from individual finger joint segments 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-F™ Processing Unit (BFPU). Each channel in the BFPU has its own microphone pre-amplifier followed by analogue filtering. The filtered audio from each channel is passed to a true-RMS detector. The digitised outputs from all channels are analysed using specially developed algorithms to detect changes in the spectral power density and absolute level of the signals. These changes provide the indication that a segment of the finger joint is about to dislodge or has already dislodged.

Data from the BFPU is continuously fed to a radio modem which transmits the information to a secure database on the SLR Heggies (or Client) server. This information is analysed 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. The data from each joint can also be displayed on a secure web site which allows the joint condition to be trended and viewed at the Client's convenience, or following an alarm, SMS to ascertain the urgency of any remedial action.

Early detection allows repairs to be scheduled with minimal disruption to traffic flow and at minimum cost. BridgeAlert-F™ is normally mains powered. Solar power is an option. Battery back-up is included and has been sized to allow the unit to be powered from roadway lighting circuits that are only energised at night.

BRIDGE SAFETY AND CONDITION MONITORING

BRIDGEALERT-F™

Standard Configuration

BridgeAlert-F™ Processing Unit with built-in Radio Modem
Microphones *C/W* mounting/junction boxes (typically 4-6 mics)
System Cables
Antenna
Server Software

Physical Characteristics

Size: 300mm x 200mm x 120mm
Weight: 3Kg
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
Sun Shade: Includes spikes to deter birds from nesting on top of the unit

Specifications

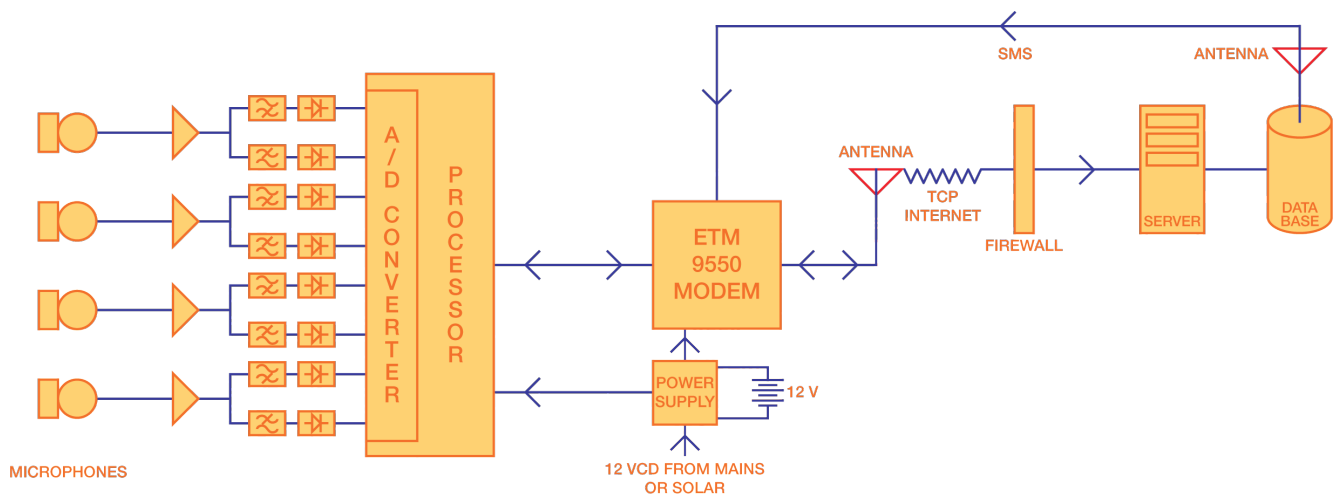
BridgeAlert-F™ Processing Unit
EMT 9550 Radio Modem
BFPU is fully sealed for rugged conditions

Power Supply Options

Mains Power: 240/115 VAC, 50 Hz – 60 Hz
Solar (Optional): Sharp Solar Panel and Regulator

Electrical

Inputs: 4 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
Back-Up Battery: 7AH Sealed Lead Acid



BridgeAlert-F™ 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 **1300 434 443** to find out more.

Heggies Pty Ltd is a member of the International SLR Group